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NIÑO (Flavio L.). Contribución al estudio de la parasitosis intestinal en la población hospitalizada de Avellaneda (Prov. de Buenos Aires). Indice amebiano. [**Intestinal Parasites among Hospital Patients in Avellaneda, Buenos Aires.**]—*Semana Méd.* 1926. Mar. 18. Vol. 33. No. 11. (1679). pp. 533–560. With 6 figs. [74 refs.]

This is a most interesting paper, based on an enormous amount of useful work, but which, being largely statistical, does not permit readily of abstraction. The author, noting in casual laboratory examinations of faeces the frequency of parasites, particularly Entamoeba, carried out systematic examinations of the excreta of 327 patients during a period of 26 months. He found 223, or 66·17 per cent., infested. Of these there were 150, or 67·26 per cent. of the positives, with a single parasite, 58 with two, and 15 with three. Protozoal far outnumbered helminthic infestations. A remarkable feature is the total absence of hookworm ova, either Ancylostoma or Necator. *Ascaris lumbricoides* and *Hymenolepis nana* were common among children. The entamoeba of dysentery was found in 53·88 per cent. ; this high figure includes cyst-carriers and others exhibiting no symptoms as well as those definitely suffering from dysentery. Trichomonas was present in 10·39, and Giardia in 6.42 per cent.

The second part of the article is occupied by a discussion on this high prevalence of amoebiasis and the epidemiological factors bearing upon it, such as : (1) the fly-menace ; (2) water-contamination, which is serious in the country parts where the water-supply is from wells or runs in canals exposed to the air ; the town itself is supplied with water beyond reproach ; (3) close contact in the schools, factories and workshops ; (4) polluted soil, which is considerable in such a warm, moist atmosphere ; (5) the existence of the disease in dogs and cats.

The article concludes with a detailed narration of three interesting cases of multiple parasitism.

H. Harold Scott.

THOMSON (J. Gordon). **Pseudoparasites in the Faeces of Man.**—*Proc. Roy. Soc. Med.* (Section of Trop. Dis. & Parasit.). 1926. May. Vol. 19. No. 7. pp. 14–18. With 25 figs. on 1 plate. [18 refs.]

This paper is merely intended to illustrate, by means of a few common mare's-nests, the verity that the microscopic examination of stools

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and the interpretation of the objects observed is an art, acquired, like other arts, only by long practice and peradventure by tribulation. Every beginner has to "discover" an air-bubble and an oil-globule at least once. Starch-granules, pollen grains, vegetable cells and fibres, vegetable spores of various shape, the "grit" (sclerenchyma) of various fruits, undigested or partially digested fragments of food of all kinds, all may cause confusion. Human intestinal cells, of which a plate of 25 figures is given, are a pardonable source of error. It is only after some experience that an observer learns that those familiar implements of research the distilled-water flask and the normal saline bottle may contain a fauna of protozoa, rotifers, and even microscopic nematodes. Then there is the infusorial fauna that accumulates in stools that are not fresh. Besides all these there is an extraordinary miscellany of free-living animals that may be passed, particularly in the stools of children. And finally there are parasites of other animals that may be swallowed in food. These last may deceive the very prophets themselves, as the authors have recently pointed out in their account of the two common species of fish-coccidia whose spores recovered from human faeces have actually been described as new parasites of man—*humanum est errare.*

A. Alcock.

Baylis (H. A.). **On the Correct Use of Host-Names. An Appeal to Parasitologists.**—*Parasitology.* 1926. June. Vol. 18. No. 2. pp. 203–205. [1 ref.]

Since the name of its specific host may be a useful clue to the identity of a parasite, the author appeals to all good men always to refer to the host by its scientific name. Vernacular names of hosts, like "sapakara" and "comondongo" have no significance outside their own small province. Popular names, like "bison" and "dogfish," are ambiguous, since they are used in different senses in different parts of the world; or, like "tadpole-cat" and "johnny darter," are often downright misleading, since they may suggest an object of the wrong class—a stone instead of bread.

The author does not, however, quite forget the uncertainty that hangs about even scientific names, which he thinks can be eluded by mentioning both "old" and "new" host names, or by sticking resolutely to one standard authority.

A. A.

Kligler (I. J.) & Weizman (I.). **The Nature of Immunity to a Protozoan Infection.**—*Proc. Soc. Experim. Biol. & Med.* 1926. Feb. Vol. 23. No. 5. pp. 355–358. [8 refs.]

The paper deals with some aspects of acquired resistance. Rabbits and guineapigs cured of a *Trypanosoma evansi* infection by "Bayer 205" were resistant to re-infection for several months. Rabbits repeatedly injected with *T. evansi* material with a view to immunization became more susceptible to infection instead of more resistant; but when injected with a mixture of *T. evansi* and "Bayer 205" they became remarkably resistant. Benzol, which destroys leucocytes, and large doses of olive oil which "block" them naturally vanquish resistance.

A. A.

HEGNER (R. W.). **Animal Infections with the Trophozoites of Intestinal Protozoa and their Bearing on the Functions of Cysts.**—*Amer. Jl. Hyg.* 1926. July. Vol. 6. No. 4. pp. 593–601. [8 refs.]

The aim of the experiments here recorded was to ascertain whether the active trophozoites of intestinal protozoa injected into the stomach are able to reach that region of the alimentary tract where they are localized normally. Guineapigs and the following protozoa were employed : *Balantidium coli* (from pig) ; *Trichomonas caviae* and *flagelliphora* and *Chilomastix intestinalis* (all from guineapigs) ; *Entamoeba histolytica* (from cultures) and *E. muris* (from rat) ; and *Giardia canis* (from dog).

The authors give their evidence for concluding that active trophozoites of the first four species may pass on unharmed to the caecum of the guineapig, and in the case of *Bal. coli* may lodge there as an infection ; that active trophozoites of *E. muris* and *G. canis* may pass beyond the stomach unharmed ; and that active trophozoites of *E. histolytica* may survive in the stomach for some time. They do not think, however, that the results deduced from some of their experiments indicate the usual method of infection in nature—which is by cysts.

A. A.

LYNCH (Kenneth M.). **Intestinal Flagellate Infestation : Clinical Analysis.**—*Jl. Amer. Med. Assoc.* 1926. July 3. Vol. 87. No. 1. pp. 4–6. With 1 chart in text. [2 refs.]

The author analyses here the data accumulated in the study, continued during about four years, of 1,040 consecutive cases having gastro-intestinal symptoms. Intestinal Flagellates were discovered in the stools in 23 per cent. of the cases, the percentage of particular organisms being *Trichomonas hominis* in 12·5, *Chilomastix mesnili* in 7·5, *Giardia intestinalis* in 2·3, and *Tricercomonas intestinalis* in 1·5—besides 1·7 " unidentified ". The average incidence was higher in the warmer months (May-November) than in the colder (December-April), namely 27 per cent. in the former, and 15 per cent. in the latter.

The critical study is to be continued, but so far the author is unable to convict these intestinal flagellates of pathogenous activity, with the somewhat doubtful exception of chronic cholecystitis. It seems fairly clear to him, on the other hand, that advanced age and diminished gastric acidity are predisposing factors in infestation.

A. A.

DESCHIENS (R.). Les infections intestinales à flagellés au Maroc. [**Flagellate Intestinal Infection in Morocco.**]—*Bull. Soc. Path. Exot.* 1926. May 12. Vol. 19. No. 5. pp. 353–359. [14 refs.]

Multiple and single Flagellate infections have been observed in 10·7 per cent. of sufferers from intestinal disorders in Morocco—*Chilomastix mesnili* in 7·5 per cent. of stools examined, *Giardia intestinalis* in 1·5 per cent., *Trichomonas intestinalis* in 1·5 per cent., and *Cercomonas longicauda* in 0·2 per cent. The pathogenous effects of *Giardia* are generally admitted, and it is very likely that *Chlomastix* and *Trichomonas* also cause or complicate intestinal disorders.

In the temperate regions of the Mediterranean basin infections of *Chilomastix* are more frequent than infections of *Trichomonas* ; in the intertropical regions the reverse is the case.

A. A.

GLASER (R. W.). **The Isolation and Cultivation of** *Herpetomonas muscae-domesticae.*—*Amer. Jl. Trop. Med.* 1926. May. Vol. 6. No. 3. pp. 205-219. With 2 plates. [17 refs.]

Describes a method by which *Herpetomonas muscae-domesticae* can be freed from its concomitant intestinal flora and grown indefinitely in pure culture. The details are too long to quote, but the principles of the method are : (1) to get rid of the intestinal flora by inoculating the diluted gut-contents of the infected fly into a number of fairly well-grown silkworms. Most of the silkworms (sometimes, unfortunately, all of them) die of bacterial septicaemia as a result, but in the survivors a few herpetomonads may be found for a time without concomitant bacteria. From the blood of these survivors pure cultures of the herpetomonas can be raised (2) on a special medium consisting mainly of filtered crushed silkworm-juice and afterwards (3) by transplantation on to NNN and other media.

A. A.

CASTEX (Mariano R.) & GALAN (Julio César). La giardiase duodénale. [**Giardiasis of the Duodenum.**]—*Bull. et Mem. Soc. Méd. Hôpit. de Paris.* 1926. Mar. 11. Year 42. 3rd Ser. Vol. 50. No. 9. pp. 385–388. [15 refs.]

The authors refer to previous observations on this subject.

In the present paper they discuss the subject of vesicular Giardiasis, based on a study of two cases in one of which although Giardia was found both in the faeces and in the duodenal fluid obtained by tubage, yet it was not to be found either on the wall or in the bile of the gall-bladder when that organ was removed by operation. This, they insist, is no proof that the parasite does not get into the gall-bladder, but merely demonstrates that it is not to be inferred to be in the gall-bladder because it is found by duodenal tubage—unless it be certain that the fluid obtained by tubage is " bile B " (i.e. pure bile unmixed with duodenal fluid).

A. A.

MARCELLUS (M. B.). [**Giardiasis (Lambliasis) ; Five Cases.**]—*U.S. Veterans' Bureau Med. Bull.* Wash. 1925. Dec. Vol. 1. p. 1. [Summarized in *Jl. Amer. Med. Assoc.* 1926. Jan. 16. Vol. 86. No. 3. p. 229.]

Five cases of giardiasis from Portland, Oregon. Usual symptoms of chronic enterocolitis or cholecystitis, weakness, loss of weight, neurasthenia. Tubage revealed in four cases many active forms in the bile.

A. A.

FÉDOULOW (A. W.). *Chilomastix mesnili* à Tachkent. [*C. mesnili* **at Tashkent.**]—*Jl. Méd. de l'Asie Centrale.* 1926. Vol. 5. No. 2. French summary pp. 139–140. [In Russian pp. 99–103.]

The French summary merely states that the Russian author describes four cases of enteritis in which *Chilomastix mesnili* was observed in the faeces, and thinks it possible that the organism is pathogenous.

A. A.

WENYON (C. M.). **Coccidia of the Genus *Isospora* in Cats, Dogs and Man.**—*Parasitology.* 1926. June. Vol. 18. No. 2. pp. 253–266. [11 refs.]

This is a reply to DOBELL's criticism (*ante* p. 702) of the author's paper (*loc. cit.*, Vol. 20, p. 785) on the Isospora of cats and dogs and man. The author sees no reason for altering his original conclusions, which are reaffirmed as follows :—

"Cats and dogs are liable to infection with three species of *Isospora*, viz., *Isospora felis*, Wenyon, 1923, with oöcysts 30–45 microns in length, *Isospora rivolta* (Grassi, 1879), with oöcysts about 20–25 microns in length, and *Isospora bigemina* (Stiles, 1891) with oöcysts about 10–16 microns in length. *I. bigemina* is very liable to invade the sub-epithelial tissues of the villi, in which case the oöcysts attain maturity in this situation. It is possible that *I. rivolta* may behave in a similar manner.

"Human beings are liable to infection with *Isospora belli*, Wenyon, 1923, and possibly a smaller species *Isospora hominis* (Railliet & Lucet, 1891) which, as far as can be judged from the published record of Virchow, resembles *I. bigemina* as it occurs in the dog. It is not admissible to conclude without further evidence that these two forms, *I. belli* and *I. hominis*, are identical."

A. A.

CHATRIDSE (I.) & KIPSCHIDSE (N.). Ueber einen Fall von Coccidiosis beim Menschen, Spezies *Isospora hominis* [**A Case of Coccidiosis in Man.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. June 1. Vol. 30. No. 6. pp. 248–250. With 1 text fig.

This is said to be the first case of coccidiosis reported from Georgia, the patient, a man of 50 years, having lived all his life in the neighbourhood of Tiflis. Under the influence of injections of emetine the number of oocysts was greatly reduced.

A. A.

HEGNER (R. W.) & MACDOUGALL (Mary Stuart). **Modifying the Course of Infections with Bird Malaria by Changing the Sugar Content of the Blood. (Preliminary Report).**—*Amer. Jl. Hyg.* 1926. July. Vol. 6. No. 4. pp. 602–609. With 5 text figs. [10 refs.]

In the experiments here outlined, which were suggested by the fact that BASS and JOHNS had cultivated malaria parasites in the blood of a diabetic without addition of sugar to the culture-medium, the authors hoped to obtain some light on a possible cause of relapses in malaria. They used infected canaries, increasing the sugar of the blood by giving them glucose-solution and decreasing it by insulin injected through the peritoneum. A later and fuller paper is promised. For the present, the authors have no doubt that an increase of the blood-sugar is favourable for the parasite, prolonging the infection to a fatal ending. Experimental attempts to decrease the sugar of the blood by means of insulin have, they say, given suggestive but not conclusive results.

A. A.

DUNCAN (J. T.). **On a Bactericidal Principle present in the Alimentary Canal of Insects and Arachnids.**—*Parasitology.* 1926. June. Vol. 18. No. 2. pp. 238–252. [7 refs.]

The author has investigated the nature and properties of a bactericidal principle existent in the gut-contents—and in the case of the insects

also in the faeces—of the following arthropods: *Stomoxys calcitrans, Musca domestica, Anopheles bifurcatus, Aëdes cinereus, Cimex lectularius, Rhodnius prolixus, Argas persicus,* and *Ornithodorus moubata.* In all experiments the gut-contents or faeces were first heated to 60° C. to overpower any bacteriolysin derived from the host's blood, etc.

The bacteria most affected were the common sporing aerobes and the staphylococci, but *B. anthracis* was destroyed by the gut-contents of Stomoxys, and *M. catarrhalis* and *S. haemolyticus* by those of Argas.

The conclusions from the bactericidal and absorption tests are that the active principle in any one species of arthropods is single and that different groups of bacteria differ in their degree of susceptibility, many bacteria being wholly resistant. The widest range of action was shown by the gut-contents of Stomoxys and Argas, and the least by those of bugs. Sporing bacilli are more susceptible and staphylococci less susceptible to Stomoxys material than to Argas material. The gut-contents of the ticks had a feebly destructive action on *B. pestis,* but those of some of the insects enhanced the growth of *B. pestis.*

The bactericidal principle is more active at 37° C. than at room temperature; is not attended by any visible bacteriolysis; retains unimpaired activity for at least 6 months when kept dry; resists temperatures as high as 120° C.; is not destroyed by tryptic digestion; is precipitated from solution with proteins by alcohol and by acetone, but is itself not affected by those re-agents; and is not soluble in the common fat-solvents. By repeated action on small doses of bacteria it rapidly becomes exhausted, and it can be inactivated by large doses of killed bacteria, even of species that are not destroyed by it. It may be adsorbed in small amount by absorbent paper. It shows none of the properties of the bacteriophage, and it differs from lysozyme. In action it closely resembles an antiseptic. In respect of its source, it is formed, somehow, in the stomach, but not from the hosts' blood.

A. A.

PATERSON (Nellie F.). **The Effects of Changes of Hydrogen-Ion Concentrations on Culicine Mosquito Larvae.**—*S. African Jl. Sci.* 1925. Nov. Vol. 22. pp. 311–317.

An account of some laboratory experiments with larvae of *Culex fatigans* and *Theobaldia longiareolata* treated with larvicidal solutions of varying pH concentration. The larvae were taken from water having a pH concentration of 7·8, and it is claimed that larvae survived longer and went on to their final metamorphosis into adults more frequently in solutions having a pH value of 7·8 or 7·6 than in other solutions. The solutions used were copper sulphate, superphosphate, lime, and common salt. The experiments with copper sulphate do not seem to have shown more than that strong solutions are more toxic than weak solutions. On the other hand, in weak solutions of lime (17 in 10,000,000, and pH concentration of 8·4) larvae succumbed in four days, whereas in very much stronger solutions (17 in 100,000, with a pH concentration of 10) larvae lived for 47 days and 15 per cent. of them went on to the adult stage. Similarly, in weak solutions of superphosphate (17 in 1,000,000, with a pH concentration of 7·2) larvae died in five days, whereas in a stronger solution (17 in 100,000 with pH 5·8) larvae lived for 17 days and 10 per cent. went on to the adult stage, and in still stronger solution (17 in 2,000 with pH_3, and 17 in 10,000 with $pH_{3\cdot4}$) they lived for three days. [The experiments in

every instance seem to have been conducted by introducing 20 larvae (at different instars) into 200 cc. of the sterile solution to be tested, so that the value of their practical application in a natural environment is not easy to estimate].

A. A.

SYMES (C. B.). **The Mosquito Problem in Kenya.**—*Kenya Med. Jl.* 1926. July. Vol. 3. No. 4. pp. 93–103.

The author, who refers to himself as " a mere entomologist," states that in 1925 over 20 per cent. of all cases treated in Kenya Government hospitals, 13·7 per cent. of the sick-rate of the King's African Rifles, and nearly the same sick percentage of the staff and recruits at the Police Depot at Nairobi, were due to malaria and that " in the absence of definite records one gathers the impression that malaria is worse now in Kenya than it was 20, 10, or even 5 years ago." Most of this paper on the " mosquito problem " covers the usual well-known ground, though the author, notwithstanding the significance of some of his local observations, does not appear to realize the potent influence of the dwelling-house upon the incidence of malarial infection.

The following interesting items may be noticed: On plantations (estates) in Kenya *A. costalis, christyi*, and *funestus* appear to be the prevalent species ; but labour is so easily obtained that managers have not yet learned to realize the practical importance of malaria.

On Native Reserves the indigenous methods of cultivation encourage mosquito-breeding. It has been noticed, however, in the course of collection that native " huts with fires are not attractive to food-seeking female mosquitoes," and that " in native villages it is in the huts set apart for the unmarried members of the community that the majority of Anophelines is found. In these huts no cooking goes on, and no fires are lighted." Dealing with towns (Nairobi) the author thinks it " quite safe in saying that 75 per cent. of the Nairobi mosquitoes breed in waters that result directly from man's activities." Five species of Anopheles known to be malaria-carriers breed in the town, including *costalis* and *funestus*. In the course of a survey of the house-haunting mosquitoes 98 per cent. of the total catches made in houses in May and the last 10 days of April were Anopheles and 98·8 per cent. of the species were *A. costalis*.

A. A.

HACKER (H. P.). **How Oil kills Anopheline Larvae.** [Thesis.]—*F.M.S. Malaria Bureau Reports.* 1925. Vol. 3. 62 pp. With 2 plates and 1 text fig. [Numerous refs. in footnotes.]

The author deals in infinitesimal yet interesting detail with the appearances seen in larvae killed by contact with oil ; with the effects of differential wetting of the larval structures on the posture of the larva and on the mode of action of oil ; with the effect of water on the killing power of oil, determined by observing the length of time a larva survives in clean water after a term of exposure to an emulsion of given strength ; with the effect of oil vapours ; with various conditions affecting the spread of oil on water ; and with the relation between spreading and toxicity.

The following are his general conclusions :—

" (1). Differential wetting has been shown to be an important factor in the life-history of larvae, and in their susceptibility to the effects of oil.

"(2). Anopheline larvae place themselves at right angles to a wet object because their tails are wet and their spiracles are dry. The larvae lie parallel to a dry object because their dry spiracles are 'attracted.'

"Oil on the surface of water acts like a dry object and 'attracts' the spiracles. When contact takes place the oil is able to wet the spiracles and therefore enters the breathing tubes. Contact with oil is sufficient to kill larvae, and the appearances shown by oil in the tubes have been described.

"(3). A 0·1 per cent. solution of soap is able to wet the spiracles so that the larvae can no longer rest at the surface and ultimately drown.

"(4). Weak emulsions of oils do not enter the breathing tubes and kill larvae unless there is a film of oil on the surface. Wet oil does not 'attract' the spiracles of larvae.

"(5). The spread of oil and the movement of thymol particles depend on the affinity of water for active groups in the substance. Both may be prevented by satisfying this affinity by saturating the water with a material containing an active group.

"(6). Pure hydrocarbons do not spread on water. Oils that spread contain substances which have active groups, and these substances have an affinity for the oil on one hand and for water by means of their active groups on the other.

"If the oil contains too much active material the excess leaves the oil, satisfies the affinity of the water for active groups, and thereby prevents the oil from spreading.

"Crude oil has been shown to be a satisfactory mixture because it does not contain an excess. A method of testing whether any given mixture contains too much active material has been described.

"(7). Methods for comparing the spreading powers of oils have been suggested. One of these depends on the amount of oil which must be added to pure paraffin in order to make the mixture spread. The other is based on the extent to which inactivated water must be diluted with fresh water before the oil can spread.

"(8). The substances which cause spreading are increased by oxidation.

"(9). Pure hydrocarbons are able to wet the spiracles. They can thereby enter the breathing tubes to kill larvae.

"Volatile hydrocarbons condense as a film on the lining of the breathing tubes and produce a pseudo-anaesthetic effect.

"This film increases the absorption of alcohols and thereby enhances their toxic action, which is a true anaesthesia.

"(10). The toxicity of kerosene is increased by oxidation in the same way as the spreading power. The toxicity and the spreading power are therefore probably due to the same substances."

A. A.

COGGESHALL (Lowell T.). **Relationship of Plankton to Anopheline Larvae.**—*Amer. Jl. Hyg.* 1926. July. Vol. 6. No. 4. pp. 556–569. [11 refs.]

This paper gives the results of studies carried on at a Field Station for Malaria in Georgia; the larvae studied by field observation and dissection were *Anopheles crucians, punctipennis,* and *quadrimaculatus*; the breeding-places of which the characters and plankton were observed and determined were ponds, streams, swamps, "lime-sinks," borrow-pits, wells, sumps, and "syrup-kettles."

For these 3 species ponds are a most prolific breeding-ground, especially near habitations. Larvae were found in nearly all streams, but not in running streams. Dense dark swamps not reached by the sun contained no larvae, not even when near habitations frequented by

adults. Borrow-pits did not harbour larvae if they were bare of vegetation. Wells, although their food-supply was scanty, bred *A. punctipennis*. Larvae were found in a sump containing large numbers of green algae and giving out an odour.

Repeated observations indicated that the larvae specified had no predilections in the matter of food, but adapted themselves to the plankton of the water they happened to be in. It seemed likely, however, that the female Anopheles exercised some discrimination in depositing her eggs on water having an odour.

A. A.

BRADLEY (G. H.). **Observations on the Emergence of Anopheles Mosquitoes.**—*Amer. Jl. Trop. Med.* 1926. July. Vol. 6. No. 4. pp. 283–297. With 2 plates. [7 refs.]

This paper describes observations made to determine the rate of emergence of Anopheles from breeding-waters (and the numerical proportions of the sexes) per unit of area. Nets suspended on floats (or cages resting on the bottom) were used for trapping the emerging insects; the stations of these were shifted, and only the numbers emerging in the first four days at each station were included in the calculations. Concomitant surveys were made of the "larval density" of the waters under observation.

In 904·9 square yards of water surface covered by nets, 585 adult Anopheles emerged into the nets—a daily average of 0·653 per sq. yd. The nets were stationed in areas that showed a higher larval count than was usual in the local breeding-grounds. "The females of Anopheles were found to emerge in somewhat greater numbers than the males." [But it does not follow from these limited observations that females are produced in nature in greater numerical proportions than males].

A. A.

MAYNE (Bruce). **Notes on the Influence of Temperature and Humidity on Oviposition and Early Life of Anopheles.**—*Public Health Rep.* 1926. May 21. Vol. 41. No. 21. pp. 986–990. [1 ref.]

This paper records some suggestive observations, particularly upon the influence of temperature, on the egg and larva stages of the Anopheles of the southern U.S.A. Although in these States all stages of Anopheles may be found during the colder months, eggs are not laid at temperatures of 40°–54° F. and are not hatched at temperatures of 58°–59° F., though laying occurs at temperatures of 55°–62° F., and hatching at 66°–70° F. Of 487 eggs laid at temperatures of 56°–62° none hatched during an observation term of 14 days, but 100 eggs laid in the same circumstances and kept at room temperature hatched in 31 hours. In cold weather Anopheles larvae shelter in the bottom mud, particularly of deep waters. Eggs of *A. quadrimaculatus* kept on drying mud in the months July–September retained their vitality for terms ranging from 42 hours to 16 days, and those of *A. crucians* for 10 to 21 days. The mud in these experiments usually dried up in sixteen hours. It was found that larvae hatched from these desiccated eggs might complete their ontogeny in water that contained nothing but the original mud.

A. A.

DAVIS (Nelson C.). **Study on the Dispersion of Resting Anopheline Mosquitoes from Dwellings in Brazil.**—*Amer. Jl. Hyg.* 1926. Mar. Supp. Vol. 6. pp. 23–35. [9 refs.]

The author gives the results of some experiments undertaken in warm weather in some coastal towns of Rio de Janeiro to determine how far individual Anopheles tended to establish themselves in particular houses. The houses selected for observation were situated in the poorer districts. The method of experiment was to spray the mosquitoes found at rest in the particular house on a given day with a stain, and to make daily captures in that house on subsequent days, examining the captures for stained Anopheles. The results showed that only 3·1 per cent. of all the Anopheles resting in all the particular houses on given days were present in the same houses on the days immediately following. [It is doubtful whether statistics of this sort, in which the conditions within and about the particular houses observed are assumed to be uniform, are of great value.]

A. A.

SENEVET (G.). *Anopheles algeriensis* transmet-il *Filaria bancrofti?* [**Does** *A. algeriensis* **transmit** *F. bancrofti?*]—*Arch. Inst. Pasteur d'Algérie.* 1925. Dec. Vol. 3. No. 4. pp. 434–435. [4 refs.]

The author states that there is no evidence to justify the assertion that *Anopheles algeriensis* is an intermediate host of *Filaria bancrofti.* The assertion is traced by him to the carelessness of a reviewer.

A. A.

DUNN (Lawrence H.). **The Prevalence and Distribution of the Yellow Fever Mosquito,** *Aëdes aegypti* **(Linn.), in Venezuela.**—*Amer. Jl. Trop. Med.* 1926. May. Vol. 6. No. 3. pp. 181–193. With 1 map in text.

Twenty-six towns and villages in northern Venezuela were inspected for *Aëdes aegypti* ("Stegomyia fasciata") by the author and his colleague, in 1925, the survey including 3,506 dwellings and 10,229 water-vessels of various sorts. In all the places except Calabozo, Ortiz, and Cristobal *A. aegypti* was found breeding.

A. A.

ROUKHADZÉ (N.). *Anopheles nigripes* Staeg. (1839) en Abasie (Géorgie). [*A. nigripes* **in Georgia.**]—*Bull. Soc. Path. Exot.* 1926. May 12. Vol. 19. No. 5. pp. 337–339.

According to this author larvae of *A. nigripes* (i.e, *A. plumbeus*) have been found, in Georgia, not usually in holes in trees, but in various places of other kinds—reservoirs of canals, old wells, earthen pots—where the water was foul from the presence of decaying leaves and other organic exuviae.

A. A.

LINDTROP (H.). Ueber das Vorkommen der *Stegomyia fasciata* am Kaukasischen Ufers des Schwarzen Meeres. [**Occurrence of** *S. fasciata* **on the Caucasian Shore of the Black Sea.**]—*Russian Jl. Trop. Med.* 1926. No. 4. German summary p. 76. [In Russian.]

The summary states that *Stegomyia fasciata,* which was noticed for the first time in Russia (at Batum) by MARZINOWSKI in 1913, was observed by the author at Sukhum and several other ports on the Caucasian side

of the Black Sea during 1925. The winter of that year was uncommonly severe, 8 to 10 or even 12 degrees of frost having been registered and more than half of the orange trees destroyed.

A. A.

SHAKHOV (S. D.). *Aëdes calopus* **Mg. according to the Observations of the Entomological Expedition in Abkasia.** *Rev. Microbiol. et Epidémiol.* 1926. Vol. 5. No. 1–2. English summary p. 107. [In Russian pp. 33–42. With 4 text figs. 5 refs.]

The summary states that *Aëdes calopus* (*Stegomyia fasciata*) has been observed in two Black Sea ports, namely, Sukhum (lat. 43° N.) and Gudanti (lat. 43°–15′ N.), further north than had ever been recorded before. They were found only in houses and breeding in water-butts.

A. A.

SINTON (J. A.). **A Simple Box for Class Demonstrations of Mosquitoes and other Small Insects.** *Indian Jl. Med. Res.* 1926. July. Vol. 14. No. 1. pp. 235–238. With 8 figs. on 1 plate.

Description in minute detail of treating an ordinary glass-bottom, cardboard, specimen-box ("pill-box") so that a specimen can be viewed from one side as well as through the bottom now treated as the top. The method is more elaborate, and the results may be more elegant than the use of a short, wide, specimen-tube having a well-fitting stopper of "cork-composition," but it does not seem to be nearly so convenient.]

A. A.

YOUNG (T. C. McCombie), RICHMOND (A. E.) & BRENDISH (G. R.). **Sandflies and Sandfly Fever in the Peshawar District.**—*Indian Jl. Med. Res.* 1926. Apr. Vol. 13. No. 4. pp. 961–1021. With 9 charts, 1 text fig. and 13 figs. on 5 plates. [23 refs.]

The chief practical aim of the investigations here recorded in replete detail was to discover the breeding-grounds of *Phlebotomus papatasii* with the object of controlling them in the prevention of Phlebotomus fever. Two areas were included in the scope of the survey, namely (*a*) the Peshawar Cantonments of the plains, and (*b*) the standing camp of Landikotal in the Khyber Pass where the incidence of Phlebotomus fever is exceptionally high.

The prospective search for breeding-grounds was begun in Peshawar by the methodical collecting of adult sandflies in the various barracks and lines. From the condition of the ovaries of the captured females, the contingency of breeding-grounds might reasonably be inferred. From this preliminary survey the important conclusion emerged - that the particular circumstance alone common to the several barracks most heavily infested with sandflies was the contiguity of broken ground.

The actual determination of breeding-grounds, of course, could only be carried out by actually searching soil for larvae. This was done by washing samples of soil through graduated sieves and mixing the final strainings with a concentrated solution of clean sugar so as to float the larvae for easy identification.

Landikotal, where the survey was continued, is a large hutted camp surrounding a fort on an alluvial plain at an average elevation of 3,500 feet. There is a garrison of 4,000 troops, British, Gurkha and Indian.

There is no pukka drainage, and such waste water as is not caught in soakpits finds its way with storm water down nullahs. Here again the breeding-grounds of *P. papatasii* were found to be in the deeper and moister layers of the organic matter that accumulates in broken and fissured soil of banks and nullahs.

It may be added that the authors confirmed by experiment the necessary conditions for a breeding-ground. An earthen pot, filled with a mixture of soil and organic matter under a superficial layer of clay in which cracks had formed by drying, was stood in water (to keep the contents moist) and placed in a cage of sandflies ; it formed a prolific and perennial breeding-pot for laboratory requirements.

"The problem of permanent material reduction of sandfly breeding in Landikotal would therefore appear to resolve itself into measures aimed at abolishing broken ground in the sides of the nullahs."

The authors discuss other prophylactic measures—repellents, fumigation, illuminated traps—but have little good to say of them as affording other than purely individual and personal relief.

They were unable to confirm WHITTINGHAM's conjectures of a Leptospira as a causative agent in Phlebotomus fever, although they are inclined to think that an investigation as to the existence of leptospirae in earth where Phlebotomus breeds is a promising line of work.

They note a direct relation between rainfall and time and intensity of seasonal incidence of Phlebotomus fever—e.g. an earlier and lighter incidence after a failure of the normal spring rains.

Other species of Phlebotomus found in the Peshawar district besides the prevalent *papatasii* are *minutus* and its *antennatus* variety, *squamipleuris*, and (at Landikotal) *sergenti*.

A. A.

POPOW (P. P.). **An Essay on the Study of Phlebotomus in Russia. Chapter I.**—*Russian Jl. Trop. Med.* 1926. No. 4. English summary p. 77. [In Russian.]

The summary states that in Russian Turkestan sandflies were first noticed by FEDSHENKO, who recognized provisionally 3 species, one of which he thought might be *Phlebotomus papatasii*. In the original Russian text, which is illustrated, the anatomy of Phlebotomus and the characters of the Russian species are described.

A. A.

DE (S. N.). *Phlebotomus argentipes.*—*Indian Med. Rec.* 1926. June. Vol. 46. No. 6. p.170. With 2 text figs.

There is nothing new or original in this paper regarding *Phlebotomus argentipes* and its recently-discovered pathogenous significance. The author makes some obvious suggestions as to the necessity of excluding it from human dwellings.

A. A.

SMITH (R. O. A.). **A Simple Method for the Staining and Mounting of Sandflies.**—*Indian Jl. Med. Res.* 1926. July. Vol. 14. No. 1. pp. 171–172. With 1 plate.

The well-known method of softening in cold KHO solution, staining (in hot carbol-eosin), clearing, and mounting in thin Canada balsam.

A. A.

COUSIN (G.). Influence du temps réservé à la nutrition sur les phases du cycle évolutif et les métamorphoses de *Calliphora erythrocephala*. [**Influence of the Nutrition Period on the Phases of Evolution and Metamorphoses of** *C. erythrocephala*. — *C. R. Soc. Biol.* 1926. July 23. Vol. 95. No. 26. pp. 565–568. [2 refs.]

The author gives here an account of his experiments in rearing larvae of the blow-fly, *Calliphora erythrocephala*, under varying conditions of *starvation*, the suitable temperature and moisture of the air apparently being undisturbed.

To begin with, he satisfied himself that at a temperature of 18°-20° C. and with a superabundance of food, the mean durations of the several stages, from hatching of egg to the completion of the full cycle in the production of eggs for the next generation, were as follows :—

Mean active larval life	8 days.
Inactive or torpid pre-pupal stage ...	3 or 4 days.
Pupa stage	13 to 14 days.
Interval between eclosion of adult and deposition of eggs	8 to 10 days.

Larvae fed sparingly and irregularly had a larva stage prolonged to twice the normal length, but the incidence and duration of the subsequent phenomena were not affected, though the adults produced were under size.

Larvae fed generously up to the 6th day of life and then abruptly starved, at once went into the inactive stage ; but, as before, the subsequent phenomena were normal in onset and duration, the adults produced being similarly under size.

Larvae fed generously for two days (when they are from one-eighth to one-tenth the normal full size) and then abruptly starved, gradually (1 to 3 days) dropped off into the pupa stage, after a varying term of great excitement. The smallest pupae had a polar diameter of 4 millim. and an equatorial diameter of 1·5 millim. As in all the other starvation experiments, however, the normal length of the pupal stage was not affected and the female adults proceeded to lay eggs 7 to 10 days after eclosion, the adults, however, being mere dwarfs.

The larvae issuing from the dwarfs' eggs repeated the history of their dwarf parents only when they were reared under the same starvation conditions. This reproduction of starvation dwarf blow-flies was continued for 3 generations. The larvae issuing from eggs of the 3rd generation were liberally fed in a normal manner, and so grew to their full specific stature and developed into adult blow-flies of the normal size for the species.

A. A.

SUTTON (E. A.). **A Case of Myiasis of the Temporal Bone.** *Jl. Roy. Army Med. Corps.* 1926. July. Vol. 47. No. 1. pp. 61–63. With 1 text fig.

The patient in this case was a European woman, in India ; the lesion was a sinus behind the ear, resulting from neglect of an abscess that had formed about 7 years previously, which had now become infested with maggots of the blow-fly *Chrysomyia bezziana*. The patient was in great pain and had a temperature of 104·6° F.

On removal of some rough dressings, an open, deep, foul cavity was disclosed, inhabited by active viciously-adherent maggots (to the number of 137). When these had been removed after flooding with a 4 per

cent. solution of chloroform water, it was found that almost all the petrous portion of the temporal bone was gone, and the dura mater laid bare in places, the damage being dangerously near the lateral sinus. A probe could be passed into the cavity through the auditory meatus.

Under antiseptic irrigation and packing with iodoform gauze, granulation began, but the prospects of complete obliteration of the cavity are doubtful. The patient was extremely ill for the first week after admission, and for the first four days was in such pain that she had to be kept under the continuous influence of morphia.

A. A.

CROSS (H. E.). **Bot Flies of the Punjab.**—*Agric. Res. Inst. Pusa. Bull. No. 160.* 1925. 16 pp. With 8 plates.

This useful compilation contains, besides descriptive matter, a number of plates in which are figured the adults and the successive stages of the larvae, with their characteristic posterior spiracles, of the Oestridae known to occur in goats, sheep, catttle, camels, and the horse in the Punjab.

A. A.

SHANNON (R. C.) & GREENE (C. T.). **A Bot-Fly Parasitic in Monkeys.**—*Zoopathologica.* New York. 1926. Jan. 22. Vol. 1. No. 7. pp. 285–290. With 4 text figs.

Description and figures of *Cuterebra baeri*, Shannon & Greene, a bot-fly maggot by which certain specimens of a howling monkey (*Alouata palliata*) from Panama have been observed to be heavily parasitized.

A. A.

SEYDEL (Ch.). Les glossines au Lomami. [**Tsetse Flies at Lomami.**]—*Bull. Méd. du Katanga.* 1926. May. Vol. 3. No. 2. pp. 52–55.

The equatorial district of Lomami in the Belgian Congo lies between lat. 34° and 35° E., and the author's observations appear to have been made late in 1925. *Glossina morsitans* was very much scarcer than KLEINE recorded it to be in 1923; this the author attributes to clearing, destruction of game, cultivation, and other influences facilitated by the new railway. *G. brevipalpis* seen often enough in 1923 was now not observed at all. *G. palpalis* appears to have been observed almost everywhere along the author's route, even at places where the banks of the river had been denuded. The author, indeed, noticed that careless clearing where the trees are actually felled wholesale and left to encumber the stream is propitious to *G. palpalis*.

A. A.

ESSED (W. F. R.). De *Sarcopsylla penetrans* en hare betrekkingen met de Elephantiasis arabum in de Kolonie Suriname. [*Sarcopsylla penetrans* **and its Relation to Elephantiasis in Surinam.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1926. Vol. 66. No. 3. pp. 424–440. With 12 figs. on 1 plate. [7 refs.]

The flea may penetrate into the corium, but usually remains in the epidermis. Oviposition is by no means always accompanied by suppuration, which indeed sometimes follows the death of the female. The high incidence of the parasite, together with the methods practised

for its extraction, frequently cause lymphangitis, and this, in the author's [and others'] opinion provides one of the necessary factors in elephantiasis, the others, viz.: *Filaria bancrofti* and *Culex fatigans* also being abundantly represented.

N. H. Swellengrebel.

WAGNER (J.) & IOFF (I.). Materialen zum Studium der Ectoparasitenfauna im S.-O. Russlands. III. Ueber Flöhe der Ziesel und der Springmäuse unter Berücksichtigung der Verbreitung der Pesterkrankungen in den Wolga-Steppen. **Suslik and Jerboa Fleas; the Spread of Plague in the Volga Steppes.**—*Rev. Microbiol. et Epidémiol.* 1926. Vol. 5. No. 1–2. German summary pp. 108–123. With 8 figs. on 1 plate. [1 ref.] [In Russian pp. 57–100. With 24 text figs.]

Descriptions of some fleas found on certain rodents in South-east Russia, with particular reference to those of the souslik (*Citellus musicus*) and jerboa (*Alactaga saliens*). The fleas found in the burrows of *Citellus musicus* are *Ceratophyllus tesquorum*, *Neopsylla setosa*, *Ctenophthalmus pollex* (n. sp.) and *Ct. brevialus* (n sp.), all of which are regarded as specific to the souslik; and *Frontopsylla* (n. gen.) *semura* (n. sp.) and *Oropsylla* (n. gen.) *ilovaiskii* (n. sp), which are not so strictly specific. The fleas of *Alactaga saliens* are *Ophthalmopsylla* (n. gen.) *volgensis* (n. sp.) and *Mesopsylla tushkan* (n. sp.). The descriptions in the Russian text are illustrated.

A. A.

EWING (H. E.). **A Revision of the American Lice of the Genus *Pediculus*, together with a Consideration of the Significance of their Geographical and Host Distribution.**—*Proc. U.S. Nat. Museum.* 1926. Vol. 68. Art. 19. 30 pp. With 8 text figs. and 11 figs. on 3 plates. [25 refs.]

The author states expressly that the scope of this paper is restricted to material collected in America. He recognizes two subordinate groups of the Linnean genus *Pediculus*, namely *Parapediculus* confined to American monkeys and *Pediculus s.s.* confined to man, and he is of opinion that the monkeys originally derived their lice from man.

Of the subgenus Pediculus he recognizes a single species, namely *Pediculus* (*Pediculus*) *humanus*, Linneus (*partim*), with 5 varieties distinguishable in America, namely: (1) *nigritarum* of Fabricius, the type host of which is the African negro; *corporis* of DeGeer (=*vestimenti* of Piaget and *corporis* of Dalla Torre); *angustus* of Fahrenholz, "type host the Japanese race"; *americanus* a new variety, the type host American Indian mummies; and *humanus* "*Pediculus* (*Pediculus*) *humanus humanus*, Lin.=*capitis* of Piaget and of Dalla Torre" of which "by a process of elimination the Caucasian race has become type host." In distinguishing the various forms included in the genus Pediculus characteristic features are detected in the form of the pleural plates, the size and shape of the thoracic spiracles, the size of the dorsal thoracic macrochaetae, the relative length of the antennal segments, and the chaetotaxy of the thumb of the 1st pair of legs of the male.

In his extensive bibliography the author has overlooked the important paper (*Trans. Roy. Soc. Edinb.*, Vol. xxii, 1861, p. 567) in which Andrew MURRAY drew attention to races of Pediculi severally corresponding with races of man.

A. A.

DELANOË (G.). La phtiriase des cils à Mazagan. **Phthiriasis of the Eyelashes in Morocco.**—*Arch. Inst. Pasteur d'Algérie.* 1925. Dec. Vol. 3. No. 4. pp. 431–433.

Crab-louse infestation of the eyelashes is extremely common among the poor Jews, both young and old, of Mazagan, but does not occur among the Arabs. The author's treatment is, after application of cocaine, to evert the eyelids and wipe them with a swab of cotton-wool soaked in grey oil; any insects that still adhere to the eyelashes after three or four wipes can be removed with a depilating forceps.

A. A.

FRANCHINI (Giuseppe). Osservazioni entomologiche sulle colonie italiane. Nota IIa. **Entomological Notes from the Italian Colonies.**—*Pathologica.* 1926. May 15. Vol. 18. No. 415. pp. 246–247.

A note on some small collections of medical entomology sent to the School of Colonial Pathology attached to the Medical Department of the University of Bologna by medical officers of the Italian colonies in Africa.

A. A.

TOLDT, Jr. (K.). Ein typischer Herd von Menschen befallenden leptusartigen Milbenlarven in Niederösterreich. [**A Typical Nidus in Lower Austria of the Leptus Larvae troublesome to Man.**]—*Wien. Klin. Woch.* 1926. July 29. Vol. 39. No. 31. pp. 890–893.

There is nothing new in this account of the familiar "harvest mites" (larvae of Trombidium) that cause such distracting itching among dwellers in the country in the hot months. Perhaps the most interesting item is the following quotation from Gilbert WHITE :—

"There is an insect with us, especially in chalky districts, which is very troublesome and teasing all the latter end of the summer, getting into people's skins, especially those of women and children, and raising tumours which itch intolerably. This animal (which we call an harvest bug) is very minute, scarce discernible to the naked eye, of a bright scarlet colour, and of the genus acarus . . . Warreners, as some have assured me, are much infested by them on chalky downs, where these insects swarm sometimes to so infinite a degree as to discolour their nets and to give them a reddish cast; while the men are so bitten as to be thrown into fevers."

A. A.

WURM (H.). Ueber eine Milbenerkrankung der Lunge bei *Macacus rhesus.* **Mite Infection of the Lungs in** *M. rhesus.*] *Cent. f. Bakt.* I. Abt. Orig. 1926. June 7. Vol. 98. No. 7-8. pp. 514–521. With 6 text figs. [4 refs.]

Pneumonyssus is a genus of Gamasid mites that infests the lungs of monkeys. Along with a description and illustrations of the lesions caused by them in the bronchi and peribronchial tissues of their hosts, the author gives a series of figures of characteristic structures of the four several species already known, and a description of a fifth (new) species with figures exhibiting its diagnostic specific characters.

A. A.

BOGEN (Emil). **Arachnidism. A Study in Spider Poisoning.**—*Jl. Amer. Med. Assoc.* 1926. June 19. Vol. 86. No. 25. pp. 1894–1896.

From the author's statement that *Lathrodectes mactans* "is probably the only poisonous spider in the United States," it is to be inferred that the serious aspects of spider-bite reviewed in this paper are to be attributed to that species. The author speaks of 150 cases recorded in the U.S.A. and of 15 additional cases in his own experience in California. In 10 of these latter cases the patient was bitten when at stool in an out-door privy. Local reaction was slight.

"Constant findings . . . are a history of a bite by a black spider, followed by excruciating pain, mainly in the legs and abdomen, extreme abdominal rigidity, high blood pressure, elevation of temperature and a polymorphonuclear leucocytosis. Large doses of opiates and the application of heat are our main symptomatic remedies, but convalescent serum seems to be of specific therapeutic value."

The author does not give any reference to records of experimental work on spider venom.

A. A.

HOUDEMER (M. E.). Note sur un myriapode vésicant du Tonkin, *Otostigmus aculeatus* Haase. **A Blistering Myriapod from Tonkin.**—*Bull. Soc. Path. Exot.* 1926. May 12. Vol. 19. No. 5. pp. 343–344.

Several species of Myriapods are known to emit a phosphorescent cutaneous secretion; according to the author this phosphorescent secretion of *Otostigmus aculeatus* is also vesicant.

A. A.

NEDERGAARD (Niels). **Venomous Jelly Fish.** *Med. Jl. Med. Assoc. Siam.* 1925. Dec. Vol. 8. Pt. 3. pp. 10–13.

The author does not refer at all to the rather considerable literature of this subject and we give his unsophisticated summary for what it is worth :—

"Jelly fish of the brown variety encountered along the coast of the Gulf of Siam emit a virulent poison. This poison appears to be contained in certain cells on the fronds and body of the jelly fish. These cells are capable of independent existence in sea water, as flagellates. Actual contact with a jelly fish is not a necessary condition for receiving a burn. Only jelly fish in normal health carry this poison in dangerous amounts. Aside from the immediate application of a mild alkali, like common soda, and protection later against infection and irritation, all vigorous treatment of the burn is useless, and may be harmful."

A. A.

ALLNUTT (E. B.). **The Effects of a Sting by a Poisonous Coelenterate.** *Jl. Roy. Army Med. Corps.* 1926. Mar. Vol. 46. No. 3. pp. 211–213.

A good account from Bermuda of the stinging effects of what was almost certainly a "Portuguese man-o-war" (Physalia). The victim was just able to struggle back to the board, whence he had dived into deep water, and then he collapsed. Brought to hospital a few minutes afterwards he was writhing in pain referred to the lumbar

region, the head was retracted and all the muscles of the trunk and limbs were in a state of rigidity, and there was dyspnoea, afterwards described as feelings as of impending suffocation. In his throes the victim tore his bed-clothes into pieces. This state of excitement lasted about an hour, the face being flushed but the temperature normal, and the pulse quickened (100) but good. Wheals as from a lash radiated over the abdomen, thighs, and flexor surface of the arms. Within three hours of the accident breathing was normal, and the lumbar pain was gone, but there was still burning pain along the wheals. The wheals were visible, though not painful, two or three days afterwards.

When, after the first agonies, the victim became coherent he explained that he had dived into a tangle of adhesive filaments of a large purple globous fish. His comrades, who picked off the filaments as soon as he had struggled out of water, were also stung, but the effects were localized.

The usual local and general treatment for soothing pain and local irritation was followed.

A. A.

HARTY (A. H.). **A Case of Cobra-Bite.** *Indian Med. Gaz.* 1926. Apr. Vol. 61. No. 4. pp. 178–179.

A mental hospital patient having got hold of a cobra 3 feet 7 inches long made a lively use of it against his fellow inmates and the staff for about twenty minutes. When he let go of it he had been bitten in two places in the hand, and his first act was to sit down and vomit. A tourniquet was applied above the elbow, the bites were incised and cauterized with solid $KMnO_4$, and 40 cc. of antivenene was injected intravenis; another 10 cc. was injected 50 minutes afterwards, and another 40 cc. 2¼ hours after that. Saliva became viscid about half-an-hour after beginning of treatment, ptosis and thick speech 55 minutes after, weakness of legs an hour-and-a-half after, difficulty of swallowing an hour and fifty minutes after, staggering gait two hours after. Improvement of speech and ability to swallow began 4½ hours after beginning of treatment, speech became quite distinct 7½ hours after, and general improvement was rapid thereafter.

The wounds on the hand sloughed [but there is no evidence that this was the result of the venom rather than of the solid $KMnO_4$].

An interesting fact is that the man's mental condition is greatly improved, so far.

A. A.

RAJU (K. V.). **A Case of Recovery after Bite by a Russell's Viper.**—*Indian Med. Gaz.* 1926. Apr. Vol. 61. No. 4. p. 179.

The patient in this case was bitten on the ankle by a Russell's viper 2½ feet long. When admitted to hospital 15 minutes afterwards "he was far from optimistic." He had some symptoms of shock and there was acute pain at the bite and a tingling and feeling of weight in the whole leg. The bite was incised immediately and cauterized with pure carbolic acid, and 35 cc. of Kasauli antivenene was injected intravenis. The patient felt better in every way 2½ hours after treatment, but complained extremely of pain in the back; he was shivering and had a temperature of 101° F. Some local swelling and oozing of haemolysed blood occurred, but gangrene did not supervene. [No mention is made

of any haemorrhages]. On the third day after being bitten, the patient was much improved ; on the fourth day he became an out-patient of the hospital, and on the thirteenth day his wound was completely cured. As the author remarks, it is fairly certain that the patient did not receive a large dose of venom.

A. A.

DE CASTRO (A. Bayley). **A Case of Snake-Bite due to** *Lachesis cantoris.—Indian Med. Gaz.* 1926. Mar. Vol. 61. No. 3. pp. 123–124.

A convict in the Andaman Islands, bitten in the third interdigital fold of the right hand by a *Lachesis cantoris*, and brought to hospital 20¼ hours afterwards. In the interval he had suffered a night of excruciating pain, and had had some vomiting. When examined, the whole right arm was tensely swollen and there were bullae along the course of the ulnar nerve to the brachial plexus. Pain, from fingers to neck, persisted until about the 33rd hour after the infliction of the bite. At about the 26th hour, much flatulence and eructation was noticed. There was no haemorrhage and no subsequent sloughing. The swelling began to subside on the fourth day. The local treatment was incision and ablution with $KMnO_4$ solution, followed by antiseptic dressings. The special treatment was by intravenous injections of $CaCl_2$.

A. A.

ANDERSON (L. A. P.). **A Case of Snake-Bite treated with Antivenomous Serum.**—*Indian Med. Gaz.* 1926. Jan. Vol. 61. No. 1. pp. 19–20. With 1 text fig.

The victim was a robust hillman of 35 years and the snake a Russell's viper 2½ feet long. The bite was on the first phalanx of the left forefinger, and one of the two punctures was a " linear cut, the result of dragging off the snake." The man came for treatment straightway, bringing the live snake with him, and received 80 cc. of Kasauli antivenene intravenis at once—about half an hour after getting bitten—the punctures being treated with iodine and dressed. Before receiving the antivenene, he had been pale and shocked, and the finger was considerably swollen ; after it he vomited at intervals for an hour, and during the first 15 minutes passed 4 or 5 liquid stools, and there was marked oedema of the hand and pain up to the axilla. A second injection of antivenene was given 85 minutes after the first. Except that the man was thirsty, and occasionally drowsy, he received no other special treatment. As soon as his safety was assured he was sent off to hospital, whence he was discharged, with some oedema of the back of the hand still remaining, in 4 days. It is admitted that " it is not possible to be sure that the patient had received a lethal dose of the venom."

A. A.

FERGUSON (E. W.). **Cases of Snake-Bite in New South Wales.**—*Rep. of Director-General of Pub. Health New South Wales for Year 1924.* pp. 171–184.

The greater part of this paper is occupied by a tabulated record of 159 cases of snake-bite, with 47 deaths, that were reported officially in

New South Wales from 1906 to 1924 inclusive. The table contains details of locality, of the individual bitten, of the part bitten, of the circumstances of the accident, of the size and the "popular" name of the snake, of the imprint of the teeth, of the treatment given, of the condition of the patient when brought for treatment, and of the result. It is not supposed that the reported cases are a complete record of all the accidents that occurred. The snakes responsible for accidents were, of course, not always venomous species. Of the truly venomous snakes, the species chiefly responsible were, *Pseudechis porphyriacus* ("black snake"), *Diemenia textilis* ("brown snake") and, less often, *Notechis scutatus* ("tiger snake").

A. A.

KRAUS (R.). Zur Serumtherapie der Bisse durch europäische Vipern. [**Serum Therapy of Bites by European Vipers.**]—*Wien. Klin. Woch.* 1926. June 24. Vol. 39. No. 26. pp. 744–745.

From neutralization experiments here tabulated the author draws the conclusion that the anti-bothrops-serum (mono- and polyvalent) so effective against the venom of South-American Viperidae will be found equally effective in the treatment of the bite of the European vipers.

A. A.

FURUTAMA (T.). Ueber die Wirkungen des Schlangengiftes auf Bakterien und Komplement. **The Action of Snake Venom on Bacteria and Complement.** *Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1926. Jan. No. 250. German summary pp. 1–4. [In Japanese.]

From the German summary, which gives merely the results of experiments, this appears to be an extremely technical paper dealing not merely with the haemolytic and bacteriolytic interactions of certain snake-venoms and the fresh serum of various animals, but also with the mechanism—if one may introduce so gross a term into such an intangible sphere—of such interactions. The specific venoms studied were from 4 species of Lachesis, an Ancistrodon, a krait, and a cobra.

A. A.

BILLARD (G.). Pouvoir "anagatoxique" du sulfate de spartéine sur le venin des vipères d'Auvergne (*Vipera aspis*). [**"Anagotoxic" Power of Sulphate of Sparteine on the Venom of** *Vipera aspis*.]—*C. R. Soc. Biol.* 1926. Mar. 19. Vol. 94. No. 10. pp. 650–652. [2 refs.]

It is known, says the author, to the shepherds of the Auvergnes that sheep browsing on broom (Genista) become what they call "benumbed," and in that state are refractory to the venom of the viper. It is easy, says he, to produce the same state experimentally in a guineapig with sulphate of sparteine (a base obtained from broom). A guineapig of 700 gm. that had received a subcutaneous injection of 1·5 cc. of a 3 per cent. solution of that salt, withstood a peritoneal injection, more than 18 hours afterwards, of 6 mgm. of viper venom—an amount of venom that killed a control guineapig in 90 minutes. This property of sparteine is by the author styled "anagotoxic"; it may be anagogue to the animal, but it is catagogue to the toxin.

A. A.

CLARK (H. C.). **Snakes of the Ulua River Valley (Honduras) (Cultivated Portion of the South Bank in the Lower Basin).** *Fourteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1925. pp. 286–297. With 1 fig.

A survey of a tract of about 50,000 acres, of which an area of 2,500 acres was in process of clearing and the rest had been recently planted, resulted, in the course of fourteen months, in a collection of 3,438 specimens of snakes, of which 3,109 have been identified. Of these, 3,109 specimens, 541 are venomous and include 312 specimens of *Lachesis atrox* (Fer de Lance), 12 of *Lachesis brachystoma*, 10 of *Lachesis schlegelii* (horned palm-viper), and 207 of *Elaps fulvius nigrocinctus* (a "coral" snake).

A. A.

BARDIER (E.) & STILLMUNKÈS (A.). Syncope adrénalino-chloroformique et envenimations. (Venins de vipère et de scorpion). **[Viper and Scorpion Venoms: their Action on Adrenalin.]** *C.R. Soc. Biol.* 1926. Apr. 30. Vol. 94. No. 14. pp. 1063–1064. [1 ref.]

Notwithstanding that scorpion-venom is hypertensive and cardio-retardant and viper-venom hypotensive and cardioaccelerant, they both exercise an apparent physiological neutralization upon adrenalin.

A. A.

MITRA (P. N.). **A Case of Hirudiniasis of the Male Urethra.**—*Indian Med. Gaz.* 1926. Jan. Vol. 61. No. 1. p. 22.

A small boy, in the state of nature, was fishing when he noticed a leech entering his urethra. He tried to pull it out, but it managed to get away into his bladder. When he was brought to hospital, blood was dripping from the meatus. The bladder was emptied (of blood and urine), washed out, and then charged with some strong salt solution and adrenalin, which was left in for the night. Next morning, micturition being impossible, bloody urine was again withdrawn by catheter, and the bladder again charged with salt and adrenalin solution. It was not until the third night—the treatment being continued the while—that the leech, then dead, was expelled, with violent pains. The dead leech was 4 inches long and half an inch broad.

A. A.

CARPENTER (G. D. Hale) with an Appendix by POULTON (E. B.). **Speke's Tragelaph on the Sese Isles of Lake Victoria.**—*Proc. Zool. Soc.* London. 1925. Pt. 4. pp. 1423–1430. With 1 plate & 1 text fig.

This paper has two instructive aspects. First, it has an admonition for the sanitary reformer, in illustrating the repercussive effects of interference with the balance of an established natural environment and this is its chief interest for us.

After the outbreak of the great epidemic of sleeping-sickness in Uganda the inhabitants of the Sese Archipelago in Lake Victoria were translated; the islands therefore gradually went back to jungle and the situtunga or swamp-buck (Speke's Tragelaph), exempt from persecution by man, greatly flourished. When, subsequently, in 1912–1913, the author visited the Archipelago, and lived in the island of Bugalla, he

found that the situtunga had changed in habits from a swamp-buck to a bush-buck and would spend the day in the heavy forests bordering the lake, and the evening in grazing on the open grasslands. Another observer (FISKE) who visited another island (Nkosi) during the war, found that there, too, the swamp-buck had become very plentiful and had adopted the habits of a bush-buck, and had cut regular lanes through the dense undergrowth of the forest.

In March 1925 the author revisited Bugalla and found that the buck had now destroyed all the undergrowth except one particular plant that they seemed to dislike, and that this destruction of the undergrowth was coincident with remarkable changes in the insect fauna. Butterflies that had been common in 1912–13 had now disappeared, and catches of *Glossina palpalis*, which in 1912–13 had averaged 36 flies per fly-boy per hour, were now reduced to catches of 10 per hour. In Nkosi, which the author visited in April 1925, the buck had completely cleared the undergrowth; ants had enormously increased in number, and only 2 specimens of *Glossina palpalis* were taken. Though he did not see that island himself, the author states that similar destruction of undergrowth is said to have been wrought by situtunga in the forest-clad island of Damba. And on other islands of the Archipelago varying degrees of change are seen.

Apart from the changes in the flora and insect fauna of the islands consequent on the increase of the situtunga and its change of habits, as a result of the withdrawal of the human population, remarkable structural changes have come about in the situtunga itself; its feet and horns have reverted to the bush-buck type, and so pronounced are these changes in the Nkosi island stock that zoologists have given it the rank of a subspecies. This is the second interesting fact described in the paper.

A. A.

RIDING (D.). **A Case of Porocephalosis.**—*Ann. Trop. Med. & Parasit.* 1926. Feb. 11. Vol. 20. No. 1. pp. 143–144. With 2 figs. on 1 plate.

Notes the finding of encysted larvae of *Porocephalus armillatus* in liver and submucosa of duodenum at a *post-mortem* examination of a subject whose lungs were in an advanced state of tuberculosis.

A. A.

DAVIS (Nelson C.). Notes on the Female Hypopygia of Anopheline Mosquitoes, with Special Reference to some Brazilian Species.—*Amer. Jl. Hyg.* 1926. Mar. Supp. Vol. 6. pp. 1–22. With 38 text figs. [12 refs.]

JOYEUX (Ch.). Traitement et prophylaxie des maladies parasitaires d'après les travaux récents.—*Le Bull. Méd.* 1926. Jan. 27, 30. Vol. 40. No. 5. pp. 121–128.

LABORATORY REPORTS.

NIGERIA. **Annual Report of the Medical Research Institute, Lagos.** CONNAL (Andrew), Director. *Ann. Med. & San. Rep. Nigeria 1924.* Appendix I. 45 pp.

For the first time in recorded history an epidemic of Plague occurred in Lagos (but not in Iddo and Ebute Metta); it covered the latter half of the year under report. No evidence of any preceding epizootic had been observed, although in the 4 months before the epidemic over 300 rats had been examined. It is significant, however, that previous to the epidemic sudden deaths had occurred among the natives, in which examination at the public mortuary had revealed broncho-pneumonia with a large and varied confederation of micro-organisms in smears, sections, and cultures. During the epidemic the causative agent in most cases was the typical *B. pestis*; but in both the earlier and the later cases the bacilli, which were admixed with other species, were few and atypical; and in the later cases it was in some instances difficult, or even impossible, to isolate the *B. pestis* on nutrient agar. These facts in the author's opinion seem to offer some support to NORMAN WHITE's theory of two types of the bacillus, respectively responsible for bubonic and pneumonic plague. Experiments are described showing that a lung infection can be caused in guineapigs by inoculating material from a bubo into the scarified skin of the abdomen. Another noteworthy laboratory observation was the presence of *B. pestis* in the peripheral blood in a case of septicaemic plague in a native. Another notable observation was that in certain cases of plague the distribution of the bacillus in the spleen was focal, not general.

An epizootic of rats occurred at Iddo (where, however, there was not any plague in man) but not at Ebute Metta. At Lagos the epizootic figures corresponded very closely with those of the epidemic in man, a rise in the total rat figures usually preceding by one week a rise in the human cases. The rodents identified by specimens sent to the British Museum of Natural History were *Mus rattus, norvegicus, musculus,* and *Cricetomys gambianus.* Of these *rattus* and *musculus,* in about equal proportions, made up 86 per cent. of the total number of "small deer" (13,147 rodents and *Crocidura manni*) caught at Lagos.

The fleas collected, chiefly from dead rats, were *Xenopsylla cheopis* and *brasiliensis,* the former preponderating, particularly in the two worst months of the epidemic.

Details are given of a number of Asylum cases of Leprosy in which apparent cure, or considerable improvement, followed treatment with chaulmoogra oil or its derivatives.

Reports of 14 cases of Black Water Fever are analysed, all in male Europeans ranging from 22 to 49 years of age, 8 cases being fatal. All 14 had suffered from malaria; all are described as "careless" – negligent of the usual methods of avoiding mosquitoes and malaria, and inattentive to treatment. In no case could the occurrence of blackwater be attributed to overdoses of quinine. The duration of haemoglobinuria ranged from 36 to 252 hours in the 6 cases that recovered, and from 48 to 170 hours in the 8 fatal cases. Of the victims in the fatal cases, 1 was in his first tour of service, 3 were in their second tour, 1 was in the third, 1 had served five tours, 1 was in his seventh tour, and 1 in his eighth. Of the actual causes of death, 5 were suppression of urine and 3 were syncope.

Of 36 tumours received for histological diagnosis 25 in native Africans were malignant: Carcinoma, 2; adenoma, 3; epithelioma, 6; fibro-sarcoma, 4; round-cell sarcoma, 3; myxosarcoma, 2; spindle-cell sarcoma, 4; melanosarcoma, 1.

The Entomology Department was in charge of Mrs. SUMMERS CONNAL, M.B.E. Besides routine identifications for medical and sanitary officers, a systematic survey of blood-sucking flies and their endoparasites was carried on, in the course of which 266 biting flies of various species were dissected for filaria, and 426 mosquitoes of various species, collected in native huts, for determination of their endoparasites. The things found were spironema, active amoebae, and ascaris ova in the stomach, and spironema and sporozoite-like bodies in the salivary glands, of different specimens of *Taeniorhynchus africanus*; a small nematode in the stomach of a *Culex rima*; and zygotes in the stomach-wall, and filaria larvae in the thoracic muscles, respectively, in individual specimens of *Anopheles costalis*. An encysted nematode was discovered in 2 specimens of *Xenopsylla brasilensis* among 47 fleas dissected.

A. Alcock.

GOLD COAST. **Annual Report of the Medical Research Institute, Accra. From April 1st, 1924 to March 31st, 1925.** [YOUNG (W. A.), Director.]—*Gold Coast Rep. Med. & San. Dept. for Period Apr. 1924–Mar. 1925.* Appendix A. pp. 42–60.

From this careful and comprehensive record the following items of general interest may be extracted:

At a post-mortem examination of a European dead of blackwater fever, the state of the kidneys attracted particular attention; they were enlarged and congested and, microscopically, there was considerable increase of fibrous tissue and the cells lining the convoluted tubules showed various degrees of degeneration and even disintegration. Such a state of chronic parenchymatous nephritis, occurring (as in this instance) in a subject having a history of repeated attacks of malarial fever over a number of years and of aversion to quinine, points the author to the conclusion that malaria must have a direct effect upon the kidney.

An account of a trypanosomiasis expedition in the Volta basin has already been noticed in this *Bulletin* (*ante*, p. 290). The author repeats the conclusion that sleeping-sickness is not rare in Ashanti, but that it is "undoubtedly chronic" and that probably many spontaneous recoveries occur.

Plague also appears to be endemic. Four cases came to notice during the year; 2 of them with lung symptoms (one of which recovered) are thought not to have been pneumonic plague. Infected rats also came to light, but not in Accra itself, and the author again remarks on "the chronicity and comparative non-virulence of *B. pestis* as seen in the Gold Coast rat." *X. cheopis* and *Ctenocephalus felis* occur on local rats, but the prevalent local rat-flea is *X. aequisetosus*.

Five certain cases of yellow fever were brought to notice—all fatal. In 2, where the onset was known and the organism could be looked for opportunely, no evidence of leptospira could be elicited by any method tried.

In the 249 microscopic examinations of tissue 3 cases of carcinoma (parotid, penis, bladder with metastasis in liver) and 12 of sarcoma

were observed; and in 192 microscopic examinations of urine 1 case of Bilharzia ova.

In 105 cases where sputa were examined *ad hoc*, tubercle bacilli were found in only 2; in the general record of post-mortem examinations (154 bodies) evidence of tuberculosis was found in 10 cases (lungs 6, brain 1, generalized 4).

As evidence of a progress that may fairly be regarded as irresistible, 8 post-mortem examinations were due to motor-cars.

A. A.

ANNALES DE LA SOCIÉTÉ BELGE DE MÉDECINE TROPICALE. 1926. Jan. Vol. 5. No. 2. pp. 141–169.—Rapport sur le fonctionnement du Laboratoire de Léopoldville pendant l'année 1924. [**Leopoldville Laboratory Report for 1924.**

The main of this report deals with matters of routine. The following items may be of general interest.

1. Observations on trypanosomiasis: "*Bayer 205*" is a powerful trypanocide especially by intravenous administration; its action is slow, but lasting; in later stages of the disease its action is not better than atoxyl, and the mortality among cases treated during 16 months was 48·1 per cent.; intrarachidian injection in a dose of 0·3 gm. was fatal, and intrarachidian administration of "serum au 'Bayer 205'" had no advantage over the intravenous method; various cutaneous eruptions and renal irritation may follow the use of "Bayer 205." Ninety chronic cases treated with *tryparsamide* showed results distinctly better than any observed with other trypanocides. *Bismoxyl* seems to be not a trypanocide. *Stovarsol*, even in daily doses of 3 gm. up to a total amount of 54 gm., proved to be but a slow and transient trypanocide.

2. Observations on yaws: *Stovarsol* is the remedy of choice; the customary dosage has been from 1 to 3 gm. for adults, and from 0·5 to 1 gm. for children, and these doses have been tolerated well; after a total amount of 8 to 15 gm. (in adults) the Bordet-Wassermann reaction is negatived in most cases; stovarsol of course is more expensive than novarsenobenzol, but cost is saved in the simplicity of its administration. *Bismoxyl* acts energetically on yaws (as on syphilis) and has kept its efficacy in the tropics; intramuscular injections may be very painful.

3. Observations on amoebic dysentery: Stovarsol used in 8 cases seemed to be beneficial only in 2; in 2 others there was a speedy relapse, and in 4 the amoebae did not disappear from the stools.

4. Culture of various bacteria under a cap of "viscose" (a vegetable parchment fabric) has given very satisfactory results, even in the case of the meningococcus.

5. A general experiment in prophylactic vaccination was made on the occasion of an outbreak of cerebrospinal meningitis; the outbreak was localized, and from the 4th June to the 8th August 23 cases had occurred—13 meningococcic, 10 pneumococcic; by the 8th August vaccination of the entire local population was completed; subsequently, between the 24th August and the 4th December, 19 cases occurred (6 meningococcic and 13 pneumococcic); of the 6 meningococcic 3 had been vaccinated and all 3 recovered after a mild attack; the vaccine

was a local strain of species A. A general experiment with an entero-vaccine was made in an outbreak of dysentery, but the results are stated to be inconclusive; among 500 individuals vaccinated, in one part of the area involved, no case occurred during the month immediately following vaccination, and among 500 individuals *not* vaccinated, in another part of the same area, 16 cases occurred during the month immediately following vaccination.

6. In the medical school for Natives there were 3 third-year, 4 second-year, and 2 first-year students.

7. To the tuberculosis infirmary 42 patients were admitted during the year.

A. A.

KENYA, Colony & Protectorate of: **Annual Report of the Bacteriological Laboratory for the Year 1923.** KAUNTZE (W. H.), Senior Bacteriologist.—*Ann. Med. Rep. for the Year ending 31st December, 1923. Colony & Protectorate of Kenya.* pp. 109–126.

The recent reorganization of the Kenya Bacteriological Department is here described. The main changes are: (1) The affiliation of the Medical Division of the Chemical Research Department; (2) the institution of a distinct Research Division, the staff of which is to be exempt from all routine work, except supervision of the preparation of plague and variola vaccines; (3) the entertainment of a Biochemist, and (4) the formation of an Entomology Division. The following generally-interesting items of the Report may be noticed.

In the routine of serum examinations *Bacillus paratyphosus* C has been detected, for the first time in Kenya; *Micrococcus paramelitensis* has also been observed, and from several localities *M. melitensis*, so that undulant fever appears to be widespread in the colony. The helminth infestations noticed are hookworm, *Ascaris lumbricoides*, *Trichuris trichiura*, *Strongylus stercoralis*, 1 case of *Schistosoma mansoni* and 1 of Hymenolepis. Among 65 tumours examined in the pathological laboratory there were a round-cell sarcoma, a melanotic sarcoma, 2 carcinomas of the eyelid, a carcinoma of the breast, and a cavernous haemangioma—all in natives.

Contamination of the Nairobi water-supply was traced to a concealed spring that opened into the bottom of the reservoir. In the examination of milk from a large dairy-farm at Nairobi, the following interesting determinations were made of the number of *B. coli* per cc. in different samples of the milk: (*a*) direct from the cow, under 100; (*b*) from a can in the dairy, over 10,000; (*c*) after pasteurization, under 100; (*d*) after cooling, under 100; (*e*) delivered in the laboratory in an insulated, airtight, dustproof, one-gallon can, subsequent to pasteurization on the previous day, under 100; (*f*) delivered in the laboratory in an uninsulated but airtight and dustproof five-gallon can, subsequent to pasteurization on the previous day, 100 to 1,000; (*g*) exactly as *f*, but a one-gallon can, neither airtight nor dustproof, over 10,000.

The number of doses of calf-lymph issued during the year was 135,062. The percentage of successful primary vaccinations ranged from 100 (in 4 districts) to 59·4 (in one district) and averaged 88·2 for the entire Province.

A. A.

TANGANYIKA TERRITORY. **Report of the Dar-Es-Salaam Laboratory for the Year 1924.** [LESTER (A. R.), Director.]—*Tanganyika Ann. Med. Rep. for Year ending December 31st, 1924.* pp. 197–216. With 4 charts.

The following items from this comprehensive report may be of general interest.

The prevalent type of malaria is subtertian; of 1,063 positive blood-films only 39 showed benign tertian. Of 3,939 blood-films examined during the year 142 (3·6 per cent.) contained microfilariae, all but 8 being in the day blood, although both Calabar swellings and Chrysops are rare. Of 32 blood-films and gland-smears examined *ad hoc*, 11 contained trypanosomes. In consequence of the previous year's reports of cases of undulant fever, agglutination tests for *B. abortus* were pursued through the greater part of this year, without a single positive result. Of 211 sputa examined *ad hoc*, 42 were positive for the tubercle bacillus, namely 31 native African, 10 Asiatic, and 1 European.

Microscope examinations of 1,180 stools disclosed Ancylostoma in 354, Ascaris in 7, Trichuris in 23, Strongyloides in 50, *Taenia saginata* in 75, *Schistosoma mansoni* in 3, *Entamoeba histolytica* in 7, other amoebae in 32, and Flagellates in 57. An entire guineaworm was found coiled in a hernial sac in the course of a surgical operation; it was kept alive in the laboratory for 12 days after removal.

"A curious feature of the so-called mango season was the influx of a number of stools consisting mainly of mucus from which . . . . no other organism than *B. coli communis* could be isolated on Conradi medium."

Cordylobia anthropophaga, the Tumbu fly, was identified in the mango season. A Tipulid fly said to be plentiful after the rains was accused of causing irritating bites. An English woman and child died within four hours of eating the roe of a globe-fish (*Tetrodon* sp.) known in the vernacular as *bunju*.

In the water reports, reference is made to an indefinitely-persistent opalescence of water containing in suspension very finely divided silica; the suspension is precipitated by alum and by lime.

Of antivariola lymph 173,550 doses were distributed—glycerinated lymph made after the Hendon method, its potency being maintained by alternate transmission between calf and monkey at intervals of a week.

A. A.

SERGENT (Edmond). Rapport sur le fonctionnement de l'Institut Pasteur d'Algérie en 1924. [**Report of the Pasteur Institute, Algeria, for 1924.**]—*Arch. Inst. Pasteur d'Algérie.* 1925. Mar. Vol. 3. No. 1. pp. 69–98. [50 refs.]

This annual report for 1924 should satisfy the most voracious appetite. Altogether 9,449 analyses were made, of which 6,771 were bacterial and medico-microbiological. 1,963 persons were treated for rabies, with a mortality of 0·05 per cent.; dogs were responsible in 931 cases and cats in 116. Malaria was light generally, owing to a dry spring; very methodical quininization was the chief antimalaria policy, but local anti-larva measures were enforced, and service-buildings in malarious places were screened. (Big antimalaria works are in the

hands of the Department of Roads and Bridges). Medical and Veterinary officers received technical instruction, and Mrs. H. A. ADIE carried on and successfully completed her investigation of the life-history of *Haemoproteus columbae*. The scientific work of the staff is noticed in this *Bulletin* as it is published; the following summary illustrates its scope: Malaria, 8 publications epidemiological, prophylactic, and experimental; Oriental sore, 3, epidemiological; undulant fever, 1, serological; tuberculosis, 6, epidemiological; trachoma, 3, epidemiological and prophylactic; general biology, 2; pathology, 2; toxicology, 2; bovine piroplasmosis, 6, general and experimental; animal trypanosomiasis, 7, various; other diseases of animals, 3; protozoology, 1; mycology, 2; medical entomology, 4. The scientific exploration of the Saharan oasis was continued.

A. A.

ARCHIVES DE L'INSTITUT PASTEUR DE TUNIS. 1925. Apr. Vol. 14. No. 2. pp. 224–245. Fonctionnement des services de l'Institut Pasteur de Tunis pendant l'année 1925. [C. N.] **[Work of the Pasteur Institute of Tunis in 1925.]**

Nearly half this report is taken up by a statement of the antirabic service, and nearly half of this, again, is a righteous homily upon a people that accepts gratuitously an expensive form of treatment for an easily avoidable disease which it takes not the slightest heed to foresee and check, the writer freely expressing his desire to have the people brought to their senses by appropriate enactments. The number of individuals applying for treatment during the year, was 1,617, of which 1,166 were actually treated—218 being cases of very severe bites. Of those treated, 3 died. The animals responsible were dogs, in 1,030; cats, in 80; horses, in 14; asses, in 12; rats, in 9; mongoose and mice, in 2 each; camel, cow, fox, jackal, mule, in 1 each; and 12 cases were "from contamination by 5 untreated men suffering from rabies."

Of antivariola vaccine, 371,832 doses were distributed, and of various other specific vaccines nearly 20,000 doses; of antitoxins (including only those prepared in the Institute) over 2,750 flasks. Summaries of the various examinations and analyses—microscopic, cultural, serological, chemical, etc.—are given.

A. A.

MAURITIUS. **Report on the Work done at the Bacteriological Laboratory for the Period October 1924 to September 1925.** [BARBEAU (L. G.), Supt. Bact. Laboratory, Reduit., Dec. 14, 1925.]—5 pp. F'cap. [Unpublished Report enclosed in Mauritius Despatch No. 6. of 7–1–26. Received from the Colonial Office, Mar. 3, 1926.]

This is a good record of a comprehensive routine. The following items may be of general interest. All three species of malaria parasites occurred in the blood examinations. In the 773 specimens of faeces examined *Entamoeba histolytica* was detected in 58, *E. coli* in 97, Giardia in 101, Trichomonas in 32, Blastocystis in 66; *Trichuris trichiura* in 525, Ancylostoma in 74, Strongylus in 41, *Ascaris lumbricoides* in 22,

Oxyuris in 4. Of 432 specimens of urine, 2 contained eggs of *Schistosoma haematobium*. Of 27 neoplasms examined 13 were malignant, and 1 bilharzial. Both stock and autogenous vaccines were prepared for local immunization by Besredka's method; but their application was limited to pyogenous organisms, where the results, especially in cases of puerperal sepsis have, so far, been encouraging. The medico-legal work of the year included investigations in 4 cases of murder, 2 of manslaughter, 21 of rape, 4 of unnatural offences, and 3 of poisoning.

A. A.

BOMBAY. **Report of the Bombay Bacteriological Laboratory for the Year 1924.** MACKIE (F. P.), Director.—51 pp. With 2 charts. 1925. Bombay: Govt. Central Press. [Price. As. 7 Ps. 6 or 10d.]

The following items from an interesting report are extracted :—

Plague prophylactic. An additional safeguard has been introduced into the preparation of the seed material. Formerly the seed flasks were inoculated direct from the heart-blood of an infected rat; now the rat-blood is inoculated on to agar slopes, from which pure colonies of *B. pestis* are fished, and from these, after testing, the seed-flasks are inoculated; no contaminations have been detected in the flasks since this technique was adopted. Statistical evidence has been collected to show that storage up to 15 months does no detriment to the immunizing power of the prophylactic. As the result of a comprehensive series of experiments a definite relation has been shown to exist between the bactericidal power of the blood of rats and their immunity to plague; from which it is argued that "it should be possible to measure directly on man the protection likely to be afforded by various kinds of plague vaccines, the proper dosage to be employed, the duration of immunity, and the effect of re-inoculation"; these experiments have shown also that the bactericidal power of the blood is not an index of the total immunity, and therefore suggest the presence of an additional tissue-immunity outside the blood-stream.

Anti-rabies treatment. Of 1,100 persons who came forward 587 went through the complete treatment, and of these 7 (1·2 per cent.) died more than fifteen days after the completion of treatment.

Pharmacology. The therapeutic values of *Holarrhena anti-dysenterica*, *Butea frondosa*, and *Gymnema sylvestre*, three common indigenous trees of considerable repute, have been studied clinically and their chemical composition determined. The bark and seeds of the first are said to be specific in amoebic dysentery, effective in bacillary dysentery, of slight use in tuberculous diarrhoea, but inert in diarrhoea of sprue and other causation. *Butea frondosa* (gum and seeds) was found to be effective in tuberculous and post dysenteric but not in other forms of diarrhoea, but did not justify its popular reputation as an anthelminthic. The leaves of *Gymnema sylvestre* were tried, and seemed to be efficacious in diminishing excretion of sugar, in two cases of diabetes.

Other Researches include bilharziasis and dracontiasis in their serological aspects and sprue in its biochemical, serological and conjectured mycological aspects. Dr. Bailey ASHFORD's association of a particular species of Monilia with sprue has not been confirmed in the course of a year's investigations.

A. A.

ASSAM. **King Edward VII Memorial Pasteur Institute and Medical Research Institute, Shillong. The Eighth Annual Report for the Year ending 31st December, 1924.** [HODGSON (E. C.), Director.]—25 pp. 1925. Shillong: Govt. Press. [Price 12 annas—1s. 6d.]

This report consists mainly of statistics of the antirabic institute and financial details of administration.

The number of patients who underwent complete antirabic treatment during the year was 1,831, including 94 Europeans. The number of deaths from hydrophobia was 14 (0·76 per cent.—all Indians), of which 5 occurred more than 15 days after completion of treatment (=0·27 per cent. failure rate). Jackals were responsible for 17 per cent. of the cases bitten.

The number of cases of kala azar treated was 156, of which 138 were discharged cured and 5 died in the course of treatment. Spleen or liver puncture was done in all cases, both for diagnosis and for determining the results of treatment. Of the 156 cases, 113 were treated with urea stibamine, 13 by sodium antimony tartrate precedent to urea stibamine, 14 by von Heyden 471, 5 by glucoside stibamine, 4 by Brahmachari 201, and 14 by sodium antimony tartrate alone. Two cases, both ending fatally, were found to be resistant to antimony in all the forms tried; the first is said to have had more than 2 gm. of sodium antimony tartrate before admission, and afterwards received 4·2 gm. of urea stibamine, 5·6 gm. von Heyden 471, and 3 gm. of Brahmachari 201, and still remained positive by spleen puncture; the second, also said to have had 2 gm. of sodium antimony tartrate before admission, afterwards received 10·95 gm. urea stibamine and 1·25 gm. Brahmachari 201 and still retained his parasites.

A. A.

FEDERATED MALAY STATES. **Annual Report of the Institute for Medical Research for the Year 1924.** [STANTON (A. T.), Director of Govt. Laboratories.]—*F.M.S. Ann. Rep. on the Med. Dept. for the Year 1924.* pp. 18–24.

In this lucid record of wide yet discriminative activity the following items are of general interest.

A new department for the prophylactic treatment of rabies has been opened. Carbolized vaccine containing 1 per cent. of nerve-tissue in 0·5 per cent. carbol saline is employed in the treatment of human cases, and for emulsification the tissue is forced through very fine wire gauze. Rabies, however, has not been prevalent, so that only 14 patients have had to be treated.

A form of typhus, novel to Malayan professional experience, has been investigated. There is no evidence that the disease is carried by lice, or spread by direct contagion from man to man; but a study of the incidence of the 18 cases discovered shows that 10 of the sufferers were keepers of cattle and 6 were soldiers from a camping ground that had been used for grazing cattle; the reasonable inference therefore is that the virus is spread by acarines—possibly, as MEGAW suspects for the Himalayan form of typhus, by ticks. The incubation stage in the 18 cases investigated has varied between 12 days and 3 weeks. The onset is sudden, with symptoms resembling influenza, the fever reaching its height (about 104° F.) on the 8th–11th day; in 13 cases the initial catarrh went on to bronchitis. A rash, in the form of a few purpuric

patches, occurred in 12 cases, but was profuse and conspicuous only in 1; in one case it so closely resembled that of typhoid fever as to mislead diagnosis. The Weil-Felix reaction was positive in all. Six cases ended—a dramatic change for the better at the end of the 2nd week—by crisis; 6 by quick lysis, and 6 by lysis. The fever was prolonged by broncho-pneumonia or by septic complications in 3 cases.

Other investigations carried on during the year have been on melioidosis, on the question of diphtheria in Malaya, on the incidence of typhoid in Malaya, and on cinchona derivatives.

In the histological department a case of blastomycosis has been noticed for the first time, the tumour being in a Chinese boy of 17 years, and 42 malignant tumours were specified—4 in Malays, 23 in Chinese, 13 in Tamils (Madrassis), and 2 in Europeans.

A. A.

ARCHIVES DES INSTITUTS PASTEUR D'INDOCHINE. 1925. Apr. No. 1. pp. 95–116.—Fonctionnement des services pratiques des Instituts Pasteur d'Indochine, en 1923 et 1924. [**Work of the Pasteur Institutes in Indo-China in 1923 and 1924.**]

These records summarize the routine work of the laboratories of Saigon and Nhatrang, that at Nhatrang being restricted to serology and animal microbiology in their veterinary applications.

At Saigon a special tuberculosis laboratory is proceeding with the necessary preliminary surveys; a systematic examination of school children is being carried out and extended to the families of those that are found to be infected, and at the present moment the *dossiers* of 400 school children and examinations of 100 families have been completed. In the laboratory of animal pathology, it was discoveerd that the lungs of 25 per cent. of the young pigs slaughtered were tuberculous. An entomology laboratory has been started for the further study of malaria. The number of persons dealt with by the antirabic department was 887, of whom 668 underwent complete treatment; of these, one died on the 21st day of treatment, and one 28 days and another 6 months after the end of treatment; the offensive animals were dogs in 864 instances, monkeys in 7, and man, fox, and rats each in one instance. Of antivariola vaccine, 3,763,710 doses were distributed in Cochinchina, Cambodia, Annam, and Laos.

A. A.

CLARK (H. C.). **Laboratory Report of Tela Hospital.**—*Thirteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass., 1924.* pp. 173–186. With 1 fig.

The number of individuals admitted to this hospital in Honduras, as given in the summary of results of examinations for intestinal parasites, was 3,240.

The great practical problem continued to be Malaria. In a very extensive coastal area neither field sanitation against the mosquito nor screening are feasible, and the labour forces there are too migrant either for educational propaganda or for attempts at quinine prophylaxis. In the diagnosis of malaria a *very* thick film method is now practised and is vastly superior to the thin film in detecting light infections.

The ten chief causes of morbidity were, malarial fevers, 1,024 cases; respiratory diseases, 379; external wounds and injuries, 306; venereal

disease, 288 ; diseases of skin and cellular tissues, 286 ; puerperal, 188 ; dysentery, 142 (including 67 amoebic) ; tuberculosis, 52 ; nephritis, 24 ; diseases of circulatory system, 23.

The ten chief causes of mortality were, lobar pneumonia, 36 deaths ; external violence, 29 ; malarial fevers (and blackwater), 14 ; nephritis, 11 ; pyaemia and septicaemia, 6 ; tuberculosis, 6 ; typhoid fevers, 6 ; dysentery, 4 ; meningitis (primary, non-epidemic), 4 ; diseases of digestive system, 4. All the deaths from lobar pneumonia - 36 deaths out of 94 cases - were of Central American natives and negroes ; the heaviest incidences of cases were December (10) and January (11) ; April (18) and May (11) ; and August (11).

Among the surgical notanda were, cancer of the cervix, 2 cases ; epithelioma (face, nose, etc.), 3 ; sarcoma of lymph gland, 1.

Among laboratory items may be mentioned the finding of malaria parasites in 11 of 32 placental bloods examined.

All hospital admissions, 3,240 individuals, were examined for intestinal parasites, with the following results : Hookworm, 1,586 infections ; *Trichuris trichiura*, 1,926 ; Ascaris, 610 ; Oxyuris, 1 ; Strongyloides, 9 ; Cestodes, 11 ; *Entamoeba histolytica*, 96 ; *E. coli*, 9 ; *E. nana*, 2 ; *Balantidium coli*, 1 ; Flagellates, 71 (reported on by HEGNER, and already noticed in this *Bulletin*, Vol. 22, p. 839).

No cases of filariasis occurred, although animal filariasis is common ; and no case of relapsing fever. Beriberi, pellagra, and dengue are very rarely encountered ; and only 2 cases of leprosy, both in West Indian negroes, have been seen in 2 years.

Venomous snakes, mostly the " fer-de-lance," are common, yet only 2 cases of snake-bite—neither of them fatal—occurred during the year.

A. A.

CLARK (H. C.). **Laboratory Report of Tela Hospital.** -*Fourteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1925. pp. 266–278.

The following items from the Tela (Honduras) Hospital Report are of general interest :

The chief cause of morbidity during the year was malaria, nearly one-third of the total number of discharges from Tela hospital during the year being recorded under malarial fevers. Next came respiratory diseases (influenza, colds, bronchitis, pneumonia), slightly more than one-eighth of the total number of discharges coming under this heading.

The principal cause of mortality was lobar pneumonia, 34 deaths—29 per cent. of the total number of deaths for the year—being due to that disease.

The only epidemic serious enough to attract attention was measles, during June.

160 carriers of *E. histolytica* were detected, of whom only 92 showed any symptoms of dysentery.

Of typhoid fever, 20 cases occurred during the year, 3 in foreign whites, 6 in negroes, and 11 in natives.

During the year, each person admitted to hospital for a time long enough to obtain films was examined for malaria by both thin and thick film methods ; of 3,566 persons examined 1,424 were positive, and the types of parasites observed were " aestivo-autumnal, 1,026 ; tertian, 292 ; quartan 26 ; mixed aestivo-autumnal and tertian 80."

A. A.

TRANSACTIONS OF THE ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE. 1925. Mar. 19 & May 21. Vol. 19. Nos. 1 & 2. pp. 1–10.—**Laboratory Meeting.**

Among the numerous interesting exhibits and demonstrations provided at this meeting, attention may be drawn to the practical applications of the following.

(1). Pseudospirochaetes, having a misleading resemblance to spirochaetes, found constantly in the cerebrospinal fluid of monkeys and rabbits by Drs. ADAMS, BLACKLOCK & MCCLUSKIE.

(2). A species of Leptospira, closely resembling *Spirochaeta icterohaemorrhagiae*, found in London tapwater, by Dr. E. HINDLE. The leptospirae are rarely to be seen in water taken straight from the tap, but occur in great numbers in tapwater which after the addition of a small quantity of human or animal faeces has been incubated for about 10 days at 25° C. They are excellent material for demonstration purposes.

(3). An ingenious method of getting ticks to feed in the laboratory at the experimenter's will, demonstrated by Drs. HINDLE & J. T. DUNCAN. HINDLE and MERRIMAN had shown that what may be inferred to be the olfactory sense of the tick has its local habitation in an organ (Haller's organ) embedded in the tarsi of the front pair of legs, since, when these parts are removed, the tick feeds without its customary discrimination.

A piece of animal membrane is closely tied across the mouth of a short tube completely filled with the liquid which the tick is required to imbibe. No bubbles must be left between the liquid and the membrane. If now the whole apparatus be stood in a water-bath maintained at a temperature of about 47° C., so as to keep the contents of the tube constantly at about 40° C., ticks deprived of the tarsi of the first pair of legs when placed upon the exposed surface of the animal membrane will attach themselves to it and take their fill as they would on a living animal.

A. A.

TRANSACTIONS OF THE ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE. 1925. Nov. 19 & Dec. 17. Vol. 19. Nos. 5 & 6. pp. 271–281. With 4 figs. on 1 plate. [3 refs.].—**Laboratory Meeting.**

Among the numerous exhibits the following are of particular interest. Sections of tissues sent by Mr. E. N. COWDRY, showing masses of his *Rickettsia ruminantium* regarded by him as the cause of heart-water in domestic ruminants in S. Africa. Specimens illustrating the life-history of Gongylonema shown by Dr. H. A. BAYLIS. Preparations of margosic acid used in treatment of syphilis and other infective granulomata and malignant growths, by Major K. K. CHATTERJI, I.M.S. Demonstrations of method for differentiation of various bacteria of the Salmonella group, by Dr. J. T. DUNCAN. Sections of intestine of kitten presumably infected by rectal injection of cysts alone of *Entamoeba histolytica*, by Mr. C. A. HOARE. Sporozoites in the salivary gland of an *Anopheles maculipennis* that was one of a batch that had proved to be infective 95 days before, that had had opportunities of injecting sporozoites on 24 occasions, and that during the 95 days had been kept in a cold chamber, except when warmed up from time to time to hasten their digestion of

blood ; also sporozoites and " zygotes " from another Anopheles of the same batch, which had lived 88 days under the same conditions ; both these were shown by Colonel S. P. JAMES, I.M.S. Cultures of spirillum of rat-bite fever, by Dr. Th. JOEKES ; the culture medium composed of inspissated horse-serum covered with Vervoort's medium, and the preferable conditions of culture being aerobic at 37° C. *Cyclops leuckarti* with a procercus of *Dibothriocephalus mansoni*, an experimental infection with oncospheres from eggs passed by a dog fed with sparganum from a Chinese snake ; also a cockroach (*Periplaneta americana*) naturally infected with Gongylonema larvae ; both shown by Professor LEIPER. Sections of cutaneous nodules in *Xeroderma pigmentosum* exhibiting definite development of basal cell carcinoma (rodent ulcer) by Colonel Marrian PERRY; the condition originated while the patient was abroad and exposed to intense sunlight, and has been steadily progressive since his return to England two years ago. *Onchocerca volvulus* embryos in skin and blood, by Dr. Dyce SHARP. Sections of abomasum of sheep containing *Globidium gilruthi* in various stages of development, by Miss M. TRIFFITT. *Endotrypanum schaudinni* within red blood corpuscle of two-toed sloth, by Drs. C. M. WENYON & H. H. SCOTT. Spleen smears of horse from Uganda showing a possible Leishmania, with a striking resemblance to spleen smears from kala azar patients, by Dr. C. M. WENYON.

A. A.

TRANSACTIONS OF THE ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE. 1926. Mar. 18 & May 20. Vol. 20. Nos. 1 & 2. pp. 1 8. With 4 figs.on 1 plate & 2 text figs.—**Laboratory Meeting.**

Dr. P. A. BUXTON showed photographs of yaws from the S. Pacific and a new instrument for measuring and integrating solar radiations.

Lieut.-Col. CLAYTON LANE exhibited diagrams illustrating efficiency of his apparatus for recovering hookworm ova, and explained his methods for collection and management of hookworm larvae : his " compact apparatus " for collection of larvae from soil by soakage through fine material supported on wire gauze in a small petri-dish, and incubation at 27° C. For checking migration of larvae he uses a nest of three petri-dishes of increasing size ; the inner one contains the mixed earth and faeces and the middle and outer contain water, the whole being kept centred by portions of thick, submerged, copper-wire ; larvae reach the outer dish with extreme rarity.

Lieut.-Col. W. P. MACARTHUR demonstrated the differential characters of the W. African species of Xenopsylla, including Synosternus.

Dr. H. J. SMYLY showed photographs of hamsters from N. China, and smears showing *Leishmania donovani* in those animals.

Dr. A. C. STEVENSON displayed sections of liver from cases of West African yellow fever. Except for the apparent absence of leptospira the histological evidence suggests that there is no difference between yellow fever in West Africa and in America.

Drs. J. G. THOMSON and A. ROBERTSON demonstrated the Coccidia of Fish -*Eimeria sardinae* from the testes and *E. clupearum* from the liver, of herrings - which they have shown may pass through the human intestine almost unchanged (*ante*, pp. 703, 704).

Dr. H. M. WOODCOCK demonstrated *Encephalitozoon cuniculi* from the rabbit. He has found these bodies not only in the brain of a rabbit

five months previously inoculated with a strain of Kling's encephalitic virus, but also (very scantily) in the brain of an apparently healthy stock rabbit. The former animal showed no symptoms up to the time when it was killed; but, post-mortem, considerable perivascular infiltration and many definite focal lesions were found in the brain. As Encephalitozoon has been regarded as a Microsporidian in proximity to *Glugea lophii* of the Angler-fish; specimens of the Glugea were shown for comparison. Sections of the hypertrophied proximal regions of cranial and spinal nerves of the infected fish showed the enormous increase in size that takes place in the infected ganglion cells; 3 or 4 parasitic cysts may develop in one nerve-cell.

Prof. WARRINGTON YORKE showed for Prof. B. BLACKLOCK, slides illustrating the development of *Onchocerca volvulus* in *Simulium damnosum*.

Drs. WENYON and H. H. SCOTT exhibited blood-films showing stages in the development of *Lankesterella minima* of the Indian bull-frog and a hitherto unrecorded Babesia in the North American racoon (*Procyon lotor*).

Prof. J. L. KIRBY-SMITH, of Jacksonville, Florida, gave a lantern demonstration of Creeping Eruption as a helminthic manifestation. "Creeping disease" has been supposed to be—and in some cases, perhaps, may be—due to a fly maggot of some kind, but in the southern and eastern States of America it seems to be caused by a microscopic nematode larva, akin to Gnathostoma, which has been named *Agamonematodum migrans*, prevalent in sandy and coast regions from spring to autumn. Nothing certain is known of the host of the adult nematode.

A. A.

SLEEPING SICKNESS.

Dye (William H.). **The Serum-Formalin Reaction in** *Trypanosoma rhodesiense* **Infection.** *Trans. Roy. Soc. Trop. Med. & Hyg.* 1926. Mar. 18 & May 20. Vol. 20. Nos. 1 & 2. pp. 74–92. With 3 text figs. [1 ref.]

A valuable paper from an author who thinks for himself, unfortunately without figures of the results of lumbar puncture. Since leishmaniasis is absent, Dr. Dye writes, from the greater part of Tropical Africa where sleeping sickness is found, it appeared important to give the serum-formalin reaction a thorough trial in the hope that it might prove of diagnostic importance and throw light on immunity and natural recovery. He had cases in all stages of the disease in a hospital camp in the south-eastern portion of Tanganyika Territory, and therefore opportunity for study of the test, before, during and after treatment. The diagnosis of *T. rhodesiense* was based on the finding of posterior nuclear forms in inoculated rats and on the local species of tsetse being *G. morsitans*.

After some account of the features of the country, he states that in March 1925 it was reported that the people in a certain village were dying in excessive numbers, in 3½ months 42 out of a population of 115. Investigation revealed 24 cases of trypanosomiasis and probably most of the 42 deaths were from that disease. Segregation and treatment were started and the figures for this and 11 other villages are given for the next 5 months. As a result of this study the author writes :—

"Clearly the disease spreads slowly and it tends to rapid disappearance. I do not think that segregation had any appreciable effect in limiting the outbreak, for few cases were detected or reported themselves until actually ill. The sick retired to the interior of their smoky huts, there to remain, even for sanitary purposes, until recovery or death overtook them. They are not, therefore, very dangerous to their neighbours. Spread of infection undoubtedly takes place in the earlier stages when, as is well known, the peripheral blood may swarm with parasites, while clinical symptoms are slight or even absent. A few cases in this stage were detected in the villages by routine blood examinations. But after May, when segregation and treatment had started, few early cases were discovered, and the disease would, I feel sure, have petered out, in any case, in much the same way as it has since done."

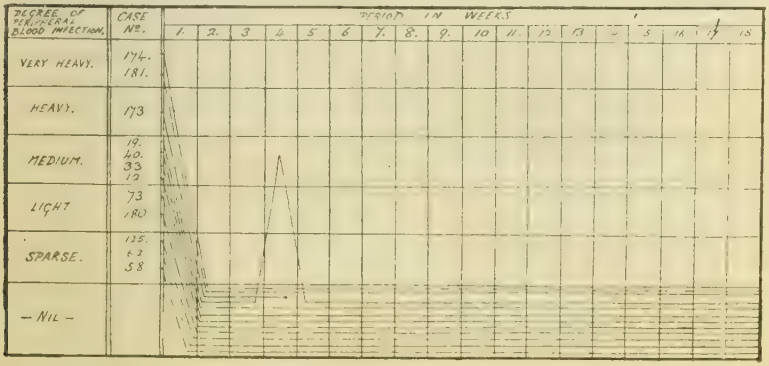
According to the natives such outbreaks have occurred frequently, the usual remedy being to remove the village. It is considered that the disease is endemic, and its spread appears to suggest "a man-to-man infection of comparatively feeble virulence."

Treatment.—Both "Bayer 205" (germanin) and tryparsamide were available. Of germanin was given 1 gm. on the 1st, 3rd, and 5th days, and then at intervals of 5 to 7 days, till 6 or 7 gm. had been reached, usually intravenously. Slight albuminuria occurred but never such as to stop treatment. The dose of tryparsamide was 3 gm. dissolved in 5 cc. of water, cold or at blood heat, 10 doses at intervals of 5 to 7 days, to 30 gm., usually intravenously: intramuscular injection caused temporary thickening and tenderness. Twelve cases were treated by each drug and the figures give a clear idea of the effects.

Whereas germanin cleared out the trypanosomes in 24 hours, not to reappear over a period of 2–6 months (one death and one relapse excepted), tryparsamide, as the notes show, was a failure. Three

of the tryparsamide cases had marked changes in the cerebrospinal fluid, but all died with no improvement in the cell-count; on the other hand, one similar germanin case did very well, with a normal count 2 months later. As the author remarks, these results differ much from those obtained in *T. gambiense* infection. One tryparsamide patient became completely blind after 30 gm.: no details of the

ACTION OF "BAYER 205" ON THE PERIPHERAL BLOOD PARASITES (*T. rhodesiense*).

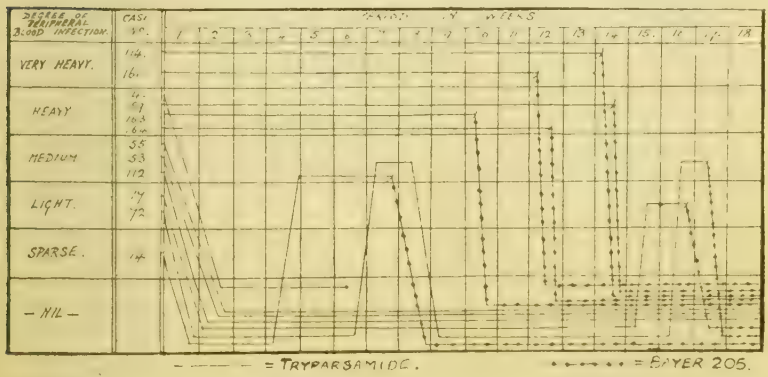


Case 173 died after 5 injections of "Bayer 205."

Case 19 relapsed once after the 5th injection of "Bayer 205," a medium infection of trypanosomes appearing in the blood for a short period.

The remainder have remained free from parasites for periods varying from 2–6 months.

ACTION OF TRYPARSAMIDE ON THE PERIPHERAL BLOOD PARASITES (*T. rhodesiense*).



Cases Nos. 161, 4, 163 and 164 died.

Cases Nos. 114, 161, 159, 163 and 164, only lost the parasites from the peripheral blood when "Bayer 205" was substituted.

Cases Nos. 17, 72 and 14 relapsed, and parasites only disappeared from the blood when "Bayer 205" was substituted.

[Reproduced from the *Transactions of the Royal Society of Tropical Medicine and Hygiene.*]

state of the C.S.F. Another series of cases began with germanin and finished with 5 weekly 3 gm. doses of tryparsamide: the results were "so spectacular" that the author now uses this method as a routine. When, however, germanin follows tryparsamide, even though the parasites disappear, the patients do not react clinically but eventually die.

The Serum-Formalin (S/F) Reaction.—

"A quantity of blood, sufficient to yield 1 cc. of serum, was drawn off by inserting a needle into a suitable vein, and running the blood into a small glass entomological specimen tube. Natural clotting was allowed, and the serum drawn off after 24 hours. One minim of liq. formaldehyde was added to 1 cc. of serum, and the specimen examined at the end of 30 minutes, 1 hour, 5 hours, and 24 hours. For convenience, the results were arbitrarily classified as follows:—

Fluid at the end of 24 hours	Negative
One-quarter solid at the end of 24 hours...	P.1
One-half solid at the end of 24 hours ...	P.2
One-half solid at the end of 5 hours ...	P.3
Three-quarters solid at the end of 5 hours...	P.4
Completely solid at the end of 5 hours ...	P.5
Completely solid at the end of 1 hour or less	P.6

Details are given of the test in tryparsamide and germanin cases and the following conclusions are reached:—

"(1). Untreated cases usually showed a P.5 reaction, but ranged from P.3 to P.6, the latter being uncommon with this species of trypanosome. The intensity of the reaction was very little, if at all, dependent on the heaviness or otherwise of the peripheral blood infection.

"(2). Cases treated with a full course of 30 grammes of tryparsamide, but failing to improve with treatment, showed little if any alteration in their blood reactions, either during or after treatment.

"(3). Those cases, if afterwards treated with "Bayer 205," often showed great improvement. When this was so the reaction dropped to negative, or at least to P.1.

"(4). Cases treated with tryparsamide, and reacting clinically and microscopically to this drug, did not show a corresponding improvement in their blood reactions.

"(5). Cases treated originally with "Bayer 205" showed a rapid, and apparently permanent, disappearance of this reaction.

"(6). The disappearance of this reaction does not eliminate the possibility of a relapse. It is not a definite criterion of cure. It is, however, a strong indication that treatment is satisfactory, for only one case that reached a negative reaction relapsed. Although "Bayer 205" has a much more potent action on *T. rhodesiense* in the blood stream than has tryparsamide, yet the presence of the reaction in the blood of these cases seems to depend on factors other than the mere presence of peripheral blood parasites."

In four instances young, apparently healthy, people were found during routine examinations of villages to harbour trypanosomes, and one of these cases is described. He had no symptom but cervical gland enlargement, had a sparse blood infection and a P.2 reaction. He received 5 injections of tryparsamide; parasites went and reaction became negative; he relapsed and reaction went to P.4; he received 4 half gramme germanin injections with fall first to P.1 and then to negative and disappearance of trypanosomes. The author thinks that more of these cases could be found if frequent routine search was made and notes that their S/F reaction is extremely mobile.

Results obtained in other infections and in undiagnosed cases:—

No solidification of serum was obtained in subtertian malaria, filariasis (*perstans* and *bancrofti*) or amoebiasis. In yaws tertiary cases

were negative, but a few in the secondary stage, chiefly children, gave a P.2 or P.3 reaction: all these came from fly areas, patients from fly free areas being negative. Treatment with bismuth did not remove the reaction but one injection of germanin removed it or reduced it in 14 days. Several patients in a leper settlement in a fly free area were tested; all types gave "a heavy and almost immediate P.6 reaction" solidification of the serum in 30 minutes, a very rare occurrence in trypanosomiasis. [The effect of germanin on the reaction was not tested in lepers.] Leprosy and yaws therefore appear to be the only diseases likely to confuse the issue.

And now follows the most interesting part of Dr. Dye's paper. In examining villagers in and close to the infected area it was noticed that a very high percentage of apparently healthy children had marked enlargement of the glands in the posterior triangles of the neck, and the glands were generally of the type associated with trypanosome infection. Figures are given from 12 villages of the total trypanosome infections found and the percentage of such children in them, and it is stated that the percentage is in close relation with the amount of infection [the reviewer cannot follow the author here; perhaps the figures have gone wrong]. These children appeared healthy, and parasites were found in only 4. One village was selected for S/F test, and 70 per cent. of these children gave a reaction of P.2 to P.4 while it is stated that children living outside the fly area showed neither the high percentage of gland enlargement nor the S/F reaction. Six children with glands received 1 gm. of germanin each; the reaction disappeared in 4 within 14 days and in the others to nil and P.1 after a month. "Seeing that 4 harboured parasites in the blood it would appear probable that the blood reaction given in the other children points definitely to an infection with trypanosomes at one time or another." He goes on to speculate whether they have recovered or still harbour trypanosomes. In any event these results suggest to him endemicity and man-to-man infection with much natural resistance. If the virulence of a strain tends to lessen with man-to-man infection, as he says has been pointed out, this might well explain the healthy carrier. He considers that natural recovery may occur with considerable frequency. Finally he expresses the opinion that in solving the problem of sleeping sickness control greater hope is to be entertained from treatment than from the "hopeless task" of fly elimination.

Results obtained from the local fauna. Of 6 waterbuck shot, 5 were positive (P.4) and in one of these trypanosomes were found; of 5 duiker 3 (P.3) (P.4) (P.5); of 2 warthog both (P.2 and 3); of 8 wildebeest 1. Of elephant, sable, hartebeest, 3, 4 and 3 were negative.

Under the heading "Conclusions" there is discussion of these results. It was noted that the S/F reaction was influenced by germanin, i.e., if 0·25 grain was left in contact with the serum for one hour before the formalin was added the reaction was retarded at least 48 hours; this did not apply to cases of leprosy. Tryparsamide in the same conditions had no effect. The C.S.F. did not give the reaction. "Although the reaction is in some degree disappointing, a negative finding in an untreated case is of undoubted value" and if in a suspected case the injection of germanin alters the intensity of the reaction it is a valuable aid to diagnosis.

The author suggests that it would be of interest to know the results of the S/F reaction in persons infected with *T. gambiense*.

A. G. B.

OLIVIER (J.). Service médical du Ruanda-Urundi. (Territoires à mandat). Rapport annuel pour 1924. **Medical Report on Ruanda-Urundi for 1924.**—*Ann. Soc. Belge de Méd. Trop.* 1926. July. Vol. 6. No. 2. pp. 115–144.

Eight pages of this report concern sleeping sickness on the north-east shore of Lake Tanganyika. Here is a plain, backed by hills, varying in width between 2 and 20 kilos, and cut by nullahs which become marshy as they enter the lake. This is good land for cultivation of bananas and *G. palpalis* abounds in the rushes on the shore and along the banks of the nullahs. In the Usumbura section 26,478 persons were examined, in 1,617 the glands were punctured, and 91 cases of infection detected; the percentage is calculated to be about 0·5. In the Rumonge section to the south 5,849 persons were examined and 487 infections revealed by gland puncture, i.e., 8·7 per cent. Measures of prevention are detailed.

A. G. B.

BLANCHARD & LAIGRET. Modifications survenues depuis 1908 dans la distribution de la maladie du sommeil en Afrique équatoriale française, et situation actuelle. **Changes since 1908 in the Distribution of Sleeping Sickness in French Equatorial Africa and the Situation To-day.**—*Ann. Méd. et Pharm. Colon.* 1926. Jan.–Feb.–Mar. Vol. 24. No. 1. pp. 67–76.

This paper consists of the conclusions of a longer one and without a map it cannot be followed. For the details the original must be consulted.

In Gabon, apart from the Upper Ogowe, the disease has not made notable progress in 15 years, and is not an important factor of morbidity and mortality. Upper Ogowe is an epidemic focus which has extended considerably and is still increasing. The proportion of infected is given as 30 per cent.

For Middle Congo the conclusion is that the disease has considerably augmented in 15 years.

In Oubangui-Shari the most notable feature is the progressive spread towards the north.

In the Chad Colony a few imported cases were noted in 1905. From 1907–8 European occupation increased both the traffic and importation of the disease. In 1914 it had reached the tenth degree of north latitude, but since then it has extended to the basins of the Lower Shari and Lower Logone and now rages to the very edge of the Lake.

The areas which are badly infested and free respectively are given in tabular form for 1908 and 1924. Taking the population of the whole area at one and a half million, the authors put the average percentage of infection at 7 and believe that the total number of infected exceeds 100,000, and assuming that all cases die in an average period of 4 years, 25,000 are lost yearly. This and concomitant effects would by itself account for the depopulation of the country.

The authors state that prophylaxis has been hitherto ineffective because of the scarcity of medical personnel and the consequent employment of incomplete atoxylization, and because of the neglect of the regulations concerning the movements of infected natives. They make suggestions to remedy these defects.

A. G. B.

BARRETS (J. Sant'ana). La maladie du sommeil dans la Guinée Portugaise. [**Sleeping Sickness in Portuguese Guinea.**]—*Bull. Soc. Path. Exot.* 1926. Apr. 14. Vol. 19. No. 4. pp. 315–317.

Though *Glossina palpalis* is prevalent in Portuguese Guinea no case of human trypanosomiasis has hitherto come to light. A European official of 40 reached Portuguese Guinea in 1912, and, with three intervals of leave in Portugal, has remained there since. He fell ill in November 1925 with fever and erythema, and trypanosomes, presumed to be *T. gambiense*, were found in his blood. The author suggests that the disease was introduced by an infected person from Angola, with which there is monthly steamboat communication. [It seems improbable that Portuguese Guinea, with sleeping sickness on each side of it, is really free from that disease.]

A. G. B.

ARCHIBALD (R. G.) & RIDING (Douglas). **A Second Case of Sleeping Sickness in the Sudan caused by** *Trypanosoma rhodesiense*.—*Ann. Trop. Med. & Parasit.* 1926. June 24. Vol. 20. No. 2. pp. 161–166. With 1 text fig. [1 ref.]

The first case of *T. rhodesiense* infection from the Sudan was recorded in 1922 (this *Bulletin*, Vol. 19, p. 876). The present case, that of a boy of 15, was seen also in the Tembura district. Trypanosomes were found by gland puncture, and 0·5 gm. of atoxyl given, followed by a dose of 1·0 gm. a week later. Ten days later, examination of the gland juice showed large numbers of trypanosomes, and, as this was unusual, smears were made by Captain MAURICE and a rat was inoculated. Later two inoculated rats were sent to Khartoum. Their peripheral blood showed an intense infection and about 20 per cent. of the short forms of the trypanosomes showed various stages of displacement of the nucleus. The patient died in spite of treatment 6 months after the diagnosis was made. A table is given of subinoculations in white rat, gerbil, rabbit, monkey and guineapig. In subinoculated white rats and gerbils posterior nucleated forms were seen. The clinical history of the case and the morphological characters of the trypanosome support the diagnosis of *T. rhodesiense*, which was confirmed by Dr. WENYON after examination of the smears.

A table of pathogenicity of trypanosomes from the 1922 case, also from Tembura, which is given, is similar to the one just mentioned. No animal survived more than 34 days. The area is one in which *T. gambiense* is endemic and "*G. fuscipes*" and *G. morsitans* abound. These two cases indicate that *T. rhodesiense* infection exists in the Bahr-el-Ghazal.

A. G. B.

BULLETIN DE LA SOCIÉTÉ DE PATHOLOGIE EXOTIQUE. 1926. Jan. 13. Vol. 19. No. 1. p. 4.—Voeux (Tryparsamide ; prophylaxie de la maladie du sommeil). [**Resolutions on Tryparsamide and Sleeping Sickness Prophylaxis.**]

The Society expressed the following views :—

1. Considering that investigations with tryparsamide have established the superiority of this drug in advanced stages of sleeping sickness, further work should be done with the p-aminoglycinephenylarsenic acids and their derivatives in order to be able to decide which

is the most economic and best as a substitute for atoxyl in prophylaxis and treatment of human trypanosomiasis.

2. The Society is much impressed with the considerable morbidity and mortality of sleeping sickness in Equatorial Africa, particularly in the Cameroons, and considers that there is no more urgent problem in these countries than the combat of this disease; it considers that technicians directly appointed by the Minister for the Colonies and furnished with administrative powers and sufficient finances should be charged with the object of combating the disease, in collaboration with the high administrative authorities and with the directors of sanitary service.

W. Yorke.

VAN DEN BRANDEN (F.). L'action du tryparsamide chez les trypanosés chroniques. Deuxième note préliminaire. [**The Action of Tryparsamide in Chronic Trypanosomiasis.**]—*Bull. Soc. Path. Exot.* 1926. Jan. 13. Vol. 19. No. 1. pp. 8–11. [1 ref.]

From the treatment of 126 cases of chronic sleeping sickness with tryparsamide (this *Bulletin*, *ante*, p. 424), the author reached the conclusion that failures, when they occurred, were due to either the co-existence of nervous syphilis or to a previous course of arsenical treatment which had rendered the trypanosomes arsenic-resistant. Details are given of a series of eight cases which support this hypothesis. Accordingly, it is proposed to replace atoxyl and soamin by tryparsamide or the similar product of Belgian manufacture—Tryponarsil; by this means it is hoped to avoid the production of arsenic-fast strains. On the other hand, in cases exhibiting marked lymphocytosis in the spinal fluid, without trypanosomes, it is necessary to eliminate the possibility of nervous syphilis, and the presence of this condition explains, in certain cases, the failure of tryparsamide. The frequent absence of parasites from the blood and glands in cases of chronic trypanosomiasis makes the diagnosis very difficult; diagnosis must, therefore, be based on the discovery of trypanosomes in the spinal fluid, and when these are absent syphilis must be excluded by performing a Wassermann test on the spinal fluid.

W. Y.

i. LAIGRET (J.). Traitement de la trypanosomiase humaine par la tryparsamide. [**Treatment of Human Trypanosomiasis by Tryparsamide.**]—*Ann. Inst. Pasteur.* 1926. Mar. Vol. 40. No. 3. pp. 173–193. [11 refs.]

ii. ABBATUCCI (S.). A propos du traitement de la maladie du sommeil par la tryparsamide.—*Bull. Soc. Path. Exot.* 1926. Apr. 14. Vol. 19. No. 4. pp. 271–275. [2 refs.] & *Ann. Méd. et Pharm. Colon.* 1926. Apr.–May–June. Vol. 24. No. 2. pp. 235–239. [1 ref.].

iii. JAMOT (E.). Au sujet du traitement prophylactique de la maladie du sommeil. [**On the Subject of the Prophylactic Treatment of Sleeping Sickness.**]—*Bull. Soc. Path. Exot.* 1926. June 9. Vol. 19. No. 6. pp. 463–471. [4 refs.]

iv. ABBATUCCI. Une révolution thérapeutique dans le traitement de la maladie du sommeil. [**A Therapeutic Revolution in the Treatment of Sleeping Sickness.**] *Ann. Méd. et Pharm. Colon.* 1926. Jan.–Feb.–Mar. Vol. 24. No. 1. pp. 83–87. [4 refs.]

i. This paper from the Pasteur Institute of Brazzaville is a reasoned statement in favour of tryparsamide, which the author thinks should supersede other remedies in French Congo. The Institute has been experimenting with the drug since 1924, at which date its value in the first stage of the disease had been fully established. They have therefore concentrated on patients at later stages, and have treated 95 natives, all with changes in the cerebrospinal fluid, most of whom have been under observation for eight months or more. Owing to the fact that insufficient supplies of the drug were available most received only a single course of 5 or 6 injections.

The cases treated are in four categories :—

1. At the beginning of the second stage—The invasion of the nervous centres is recent, and the changes in the C.S.F. slight, at most 70 lymphocytes per cmm. and 0·50 gm. albumin per litre ; trypanosomes never present. In such cases, cure by atoxyl is no longer possible. Of the 10 patients treated, 7 could be kept under observation, and were examined a month later ; in 4, the C.S.F. was normal in all respects, in 2 it was changed for the better, and 1 was normal as regards the cells ; in those which could be examined 8 months later the improvement was maintained.

2. Second stage with apparent preservation of health. In these, the C.S.F. is profoundly changed and trypanosomes are commonly found in it, but there is no clinical symptom of affection of the nervous system. The author says that the systematic practice of lumbar puncture shows that a high proportion of infected natives belongs to this category ; they are quite incurable by atoxyl and emetic. 36 were treated. In 29, followed for 8 months or more, in 9 instances the C.S.F. improved, and in 20 it became quite normal ; in 10 cases in which trypanosomes had been found they disappeared from the C.S.F. and were not found at later punctures. In one case there were transitory signs of optic neuritis. In another case, insufficiently treated, the parasites reappeared 4 months after cessation of treatment. A table shows the striking improvement in the C.S.F. in 6 instances in which the formula became normal. The significance of the disappearance of trypanosomes is stressed.

3. Advanced second period.—Here not only are there profound C.S.F. changes, but obvious changes in the clinical condition, and the improvement after tryparsamide is so striking that numbers of natives have come to request treatment just as they do for yaws. The author treated 20 cases, all with somnolence, inco-ordination of gait, facial tics, etc. There was one death and two cases of amaurosis which did not lead to loss of vision. Of the 17 remaining, one relapsed but in the rest there was a "veritable transformation" which is graphically described. In 4 instances the C.S.F. became normal ; in 10 others there was improvement in the fluid, and the author suggests that in some of such cases some of the increase in cells and albumin is permanent ; clinically they were cured. Details are given of 4 patients.

4. Terminal stage. 18 were treated, such patients as remain hidden in the villages or are brought by their friends when near death,

patients with incontinence and coma or convulsions. The four patients first treated died, 3 of them soon after the first injection. The author thinks that the more advanced the case, the smaller should be the dosage, and after this he used doses of at most 2 cgm. per kilo, repeated 2 or 3 times in the first ten days; when improvement has begun the doses may be increased. With this medication, 14 stood the drug and have survived, 7 were living 6 months later, 5 after 9 months, and one after more than a year. In 6 instances there were visual troubles which twice led to blindness. Seven cases are given in detail. A table shows the numbers treated at the lazaret and the deaths each month from May 1924 to May 1925.

Among 356 in which tryparsamide was not used there were 27 deaths.

Among 678 in which tryparsamide was generally used there were 12 deaths.

Discussing the drawbacks of tryparsamide the author points out that apart from category 4 there was only one death in this series, so that there is little danger of a fatal result except in advanced cases, and this may be avoided by reduced doses. Amaurosis is as frequent as with atoxyl at the second stage, but it does not come on so suddenly and in most cases disappears when the treatment is interrupted, which is not the case with atoxyl. In one instance there was a nitritoid crisis. If given under the skin, the drug often causes suppuration; if a vein is not accessible, it should be injected in the muscles. It has the advantage of being effective also against yaws and syphilis, so wide spread in Tropical Africa.

Discussing the use of tryparsamide in drug prophylaxis, the author says that according to VAN DEN BRANDEN it is at the first stages superior to atoxyl, but experience shows that only a small proportion of infected natives are seen at this stage. The patients with changes in the C.S.F. numbered 57 per cent. in JAMOT's series in Cameroon, and at Brazzaville there were two at the second for every one at the first stage. But atoxyl though effective at the first stage is only temporarily so at the second; the parasites of the central nervous system reinvade the blood. If the 95 patients had been treated by atoxyl in the same conditions, the relapses would have reached 40 to 50 per cent. The inference is that tryparsamide should replace atoxyl for drug prophylaxis. To the objection that injections under the skin are not tolerated the author replies that the natives accept intravenous injections because they are painless, and the native infirmiers become very skilful in giving them. Another point—it is not safe to treat patients at the second period with atoxyl without lumbar puncture, but with tryparsamide this is unnecessary.

He recommends that the infected should be assembled by clinical examination in two groups. In the first are patients at the first stage, at the beginning of the second, and those of category 2. These can all stand full doses, which for an adult of 50 kilos should be 2 gm. in the first and the second week, 2·50 in the third and fourth, 3 in the fifth and sixth. The second group, the cases with evident nervous symptoms, will receive 6 weekly injections of 1 to 2 gm. at most.

ii. Abbatucci reported to the Society that Dr. BOYÉ, Medical Inspector, Director of the Health Service of French Equatorial Africa, had written to the Inspector-General of the Health Service at the French Colonial Office about LAIGRET's conclusions, which he considered premature and not applicable in current prophylactic practice. The dosage of tryparsamide was not yet fixed. The deaths attributable to

the drug were 6·6 per cent., and loss of vision 10 per cent. The technique of administration was unsuited to native infirmiers.

The author read a note about the use of the drug which had been sent to the doctors concerned.

LAIGRET commenting on this communication said that these remarks concerned his cases; the mortality figures were correct, but all the deaths which had occurred were in very advanced cases treated at the outset. By reducing the dose he had avoided the repetition of such fatalities. The statistics of the effect on vision were inaccurate; the proportion should be 2 per cent., not 10 per cent.; he could only attribute the error to the inclusion of atoxyl-blinded cases which had remained in the lazaret; the affected patients were well advanced in the second stage. M. LEGER said that in tryparsamide treatment there were subjective signs of affection of vision which would enable one to stop treatment before irremediable damage was done objects looked at appear to move, the patients see white balls coming towards them and falling to powder before reaching them, etc. MOTAIS remarked that even in natives it is possible to test the visual acuity, which should be done regularly.

iii. Jamot discusses this subject at length in a further paper, and notes that LAIGRET proposes to substitute tryparsamide for atoxyl. He observes that the intravenous route is not indispensable, for at Leopoldville the drug has been given both into the buttock muscles and under the skin in 10 per cent. solution without inconvenience. He gives an historical account of the drug treatment of human trypanosomiasis. For the last ten years more than 50,000 patients have been treated under his direction with large doses of atoxyl, repeated as often as was possible, at intervals of 10 or 15 days, or monthly or every second or third month. He cites districts in which this has had a striking effect and the disease has regressed; but it has not disappeared, even on the Oubangui after 7 or 8 years' energetic atoxylization. The fact is that patients at the second stage on whom atoxyl has only a temporary effect represent more than half the patients, and when to these are added those at the first stage who are refractory to atoxyl we have two-thirds of the cases on which atoxyl has no lasting effect. One must conclude that atoxyl by itself will not solve the problem of drug prophylaxis. Jamot gives an account of his own experience with tryparsamide. Out of 39 patients, mostly advanced, he has had 2 deaths, 6 failures, 2 cases of transitory amblyopia and 2 of persistent amaurosis, 21 ameliorations and 6 apparent cures, i.e. 70 per cent. of more or less favourable and sometimes astonishing results in patients in bad state and doomed without the drug to a speedy death. The improvements persisted a year and a half later. There is no doubt of the great efficacy of tryparsamide in advanced cases, in which other trypanocides are almost useless. He is, however, less certain about the early cases, and thinks that more data are desirable.

His conclusion is that it is not necessary to choose between atoxyl and tryparsamide, but that these and all other trypanocides should be employed where they are appropriate.

LAIGRET thought that the following conclusions would find general acceptance:—

In trypanosomiasis patients at the first stage (with integrity of the C.S.F. rigorously established by lumbar puncture), continue to use atoxyl which has proved itself and is obtained at a lower price than tryparsamide.

In patients at the second stage (in whom lumbar puncture demonstrates the presence of leucocytosis or albumin exceeding the normal) employ tryparsamide.

Whenever there is doubt about the stage of the disease, whenever, for instance, lumbar puncture cannot be done, give tryparsamide, which is effective at both stages.

iv. Another tryparsamide article chiefly concerned with LAIGRET's papers and conveying no fresh information.

A. G. B.

WALRAVENS (P.). Tryparsamide et trypanosomiase. Névrite optique. **Tryparsamide and Trypanosomiasis. Optic Neuritis.**]—*C. R. Soc. Biol.* 1926. June 25. Vol. 95. No. 22. pp. 254–256.

After an account of 3 cases, judged by their names to be natives of Tropical Africa, the author writes to the following effect. Among 18 patients with advanced trypanosomiasis treated we have had three serious cases of impairment of vision. The first progressed to almost complete blindness. In treatment of the others more prudence was shown. The second case improved progressively and symptoms have almost disappeared. The third in spite of suspension of treatment has improved only slightly. Objectively there is no great difference between the lesions of atoxyl and those of tryparsamide, but the latter seems less harmful, for with atoxyl there is almost always progressive atrophy going on to blindness. In each the papilla becomes white, and there are signs of optic atrophy. Central vision is much affected, the visual field is contracted, peripheral vision is less concerned.

The first patient received 57 gm. in 16 weekly injections, the second 60·5 gm., and 2 months later 20 gm. in 8 injections, the third 64·5 gm. in 15 injections. [These amounts seem large for patients at the advanced stages described.]

A. G. B.

SCHOFIELD (A. T.); LOUW (Graham); LUMSDEN (K.); SOHI (Usho Ram). **Reports on Treatment of Sleeping Sickness with Tryparsamide in the Uganda Protectorate, 1925.**]—Enclosures in Despatch No. 262 from Governor of Uganda to Secretary of State dated 5th June, 1926. Received through Colonial Office, October 5th 1926. 7 pp. foolscap. [Proof X5527. Med. & San.—7506.]

Dr. A. T. Schofield furnishes a report on 14 cases, all of which appear to have been advanced. The after-treatment observation period varied as a rule from 1–5 months; in one instance it was 13 months. Lumbar puncture was not done; it is noted several times as "refused." One death occurred soon after admission. The author writes: "The intravenous injections of tryparsamide have proved to be the most encouraging treatment ever used in Toro." He commences with 2 gm. and follows with 4 or 5 weekly injections of 3 gm. Three other reports on treatment by tryparsamide accompany Dr. Schofield's—from Madi, Chua and Gulu respectively—but the data are so incomplete that no sound conclusions can be formed. [It is unfortunate that in Uganda lumbar puncture dispels confidence; it seems to be successfully practised by mission doctors elsewhere in Tropical Africa; see KING, KEEVILL, KELLERSBERGER, below.]

A. G. B.

LEWIS (Kenneth M.). **Trypanosomiasis: Relative Frequency in the United States, Tryparsamide Therapy in Refractory Cases.**—*Boston Med. & Surg. Jl.* 1926. July 22. Vol. 195. No. 4. pp. 167–168.

In the course of three years the author has seen seven cases of human trypanosomiasis in the United States, all contracted in Africa: he thinks there must be other, unrecognized, cases. The last two were refractory to treatment, including tryparsamide. Increased doses therefore up to 7 gm. were tried with happy results.

Case I, diagnosed July, 1925, in Loanda, a month after probable date of infection. Blood showed *T. gambiense*; spinal fluid negative. Treatment by 2 and 3 gm. doses of tryparsamide to a total of 21 gm.; parasites still present at conclusion. Patient seen in U.S.A. in October, 1925; no symptoms but large numbers of trypanosomes in blood; four 3-gm. doses of tryparsamide had no effect, nor had four 1-gm. doses of "Bayer." Patient then received a 5 gm. injection of tryparsamide, 2 weeks later a 6-gm. dose and two weeks later 7 gm.; thereafter 7 gm. a fortnight, and in the alternate weeks tartar emetic injections (100 mgm. doses). After the first 5 gm. dose the blood became negative and has remained so. In March, 1926, the patient's condition was excellent. The other case, also an early one, was similar. The big dose treatment of each patient is being continued, up to a total of 5 or 6 months.

Dr. PEARCE suggests that "these patients were unable to metabolize properly the smaller dose so as to obtain a therapeutic trypanocidal action and hence required the larger dose to accomplish this effect."

A. G. B.

KING (Judson C.). **The Treatment of African Sleeping Sickness with Tryparsamide administered Intramuscularly.** *Amer. Jl. Med. Sciences.* 1926. July. Vol. 172. No. 1. (No. 652). pp. 51–63. [10 refs.]

A useful paper from a Mission Hospital, describing with parasitological and cytological detail the treatment of 24 cases at Banza Manteke, near Boma, Belgian Congo. The following are the salient points. In work done under conditions that require the aid of poorly trained natives intramuscular injection is more practicable than intravenous. Hitherto it has been tried chiefly in early cases. Dr. King has studied its effect in advanced cases. He classifies them as: (1) early stages with no previous treatment; (2) later stages with no previous treatment, and (3) later stages previously treated with antimony or atoxyl or both. Most of the patients were unable to sit up and were somnolent; after the first 2 or 3 injections they walked to and fro from their villages. In each case trypanosomes were sought in the glands, centrifuged blood, and cerebrospinal fluid and the cell content of this was recorded. Solutions of tryparsamide of 20 and 30 per cent. strength were employed, injected into the glutei. One or two series were given, each of ten weekly doses of 3 gm. for patients of 50–60 kilos. Two tables give the essential details of the clinical and laboratory investigations, one of the fresh patients, the other of those previously treated. It is seen that many lumbar punctures were done, in one case 7 after conclusion of treatment, the last at 49 weeks, and in many instances the fall in number of cells is remarkable. The beneficial results are described as pronounced, but in some previously treated patients the reduction of the cell content of the C.S.F. was slow, and in one instance there was none.

Two patients, one previously treated, complained of dimness of vision after the 2nd and 3rd dose ; both were clinically well advanced. No interruption was made in the treatment and the symptoms "gradually ameliorated with a return to what appeared to be normal vision." The author has had other similar experiences. Induration of the injected area was frequent and abscesses occurred but not with the 20 per cent. solution. There was one death and one relapse. Attention is directed to the unusually low cell content of the C.S.F. in several patients, though there were symptoms of involvement of the central nervous system. Dr. King has followed 11 patients for one year, 3 for 9 months, 2 for 6 and 7, and 5 for 4 months, and no relapse has occurred.

A summary is given of the case history of each patient and the following conclusions :—

"1. Tryparsamide is well tolerated in 20 per cent. solution given intramuscularly, but in 30 per cent. solution causes more discomfort and leads sometimes to abscess formation.

"2. It has a definite trypanocidal action in the blood, the lymph and cerebrospinal fluid.

"3. With the exception of a certain type of previously treated chronic case, tryparsamide, given by the intramuscular route, is a specific in African sleeping sickness incited by *Trypanosoma gambiense*.

"4. Tryparsamide is equally efficacious in all stages of the disease, except in certain cases previously treated with arsenical and antimony preparations in which its efficiency is limited.

"There is a definite correlation between clinical symptoms, number of cells in cerebrospinal fluid and weekly treatments of tryparsamide, which may be expressed as follows : The number of cells in the cerebrospinal fluid varies inversely and the clinical symptoms improve directly with the number of weekly injections."

A. G. B.

KELLERSBERGER (E. R.). **"Bayer 205" (Germanin) in Sleeping Sickness—Report on 150 Cases Treated.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1926. June 17. Vol. 20. No. 3. pp. 185–194. [11 refs.] A French version in *Bull. Méd. du Katanga.* 1926. Feb. Vol. 3. No. 1. pp. 3–16.

A useful paper, confirmatory of previous work. In 2 years there were admitted to the hospital of the American Presbyterian Mission in the Lomani District, Katanga, Belgian Congo, a *palpalis* area, some 400 cases of sleeping sickness. The 150 cases here under review were classified under 3 heads ; (1) disease in acute stage, C.S.F. normal ; (2) pathological change in C.S.F. and sometimes trypanosomes, together with clinical changes ; (3) gross changes in C.S.F. and marked clinical signs. Trypanosomes were found in all but 4 cases, which were advanced, most frequently in the glands ; for the blood thick films were used. In most cases lumbar puncture was done before treatment, after treatment, and 3 and 9 months later.

Of 89 treated at the early stage 30 have remained well over one year, 20 over 9 months, and 35 for shorter periods. Of the 46 in category (2), 40 relapsed after 2–6 months, 4 have died, and none can be considered cured. Of the 15 in category (3), 6 have died and the rest have relapsed. The average treatment was 8–10 1 gm. doses in 8 or 9 weeks. "When concurrent infections were present (malaria, ankylostomiasis) the drug was poorly tolerated." In 80 per cent. of cases albumin appeared in the urine after 7–10 days ; in most cases the treatment was

continued and the albuminuria disappeared; the author notes that several female patients have since gone through a normal pregnancy.

An analysis of the cases which follows shows that about 100 per cent. of the early cases are cured and that very small doses may be sufficient. Three cases were quite well 2½ years after doses of 4 gm., 2 gm. and 1 gm. The author suggests that the continued activity of the drug in the body in association with proteins may explain such cures. [It is worth noting that two of the first recognized cases from the Congo, Mrs. M. and Mrs. G., infected in 1900 and 1901, though treated only with Fowler's solution, were well in 1912 and 1915 (*Sleeping Sickness Bulletin*, Vol. 2, pp. 282 and 286)].

In no case was it established that the drug reduced to any extent the cell-count in the C.S.F., though there might be a temporary improvement.

Fourteen cases in the early stage are analysed and details given in an informative table; similarly 12 cases are analysed in category (2), and 9 in category (3), all of which received full treatment with slight, if any, benefit. The final conclusion is that the usefulness of "Bayer 205" is limited to the early cases of trypanosomiasis, though it may serve as a prophylactic and protective agent.

A. G. B.

KEEVILL (Arthur). **The Treatment of Sleeping Sickness** (*Trypanosoma rhodesiense*)—**a Study of Fifty Cases.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1926. Mar. 18 & May 20. Vol. 20. Nos. 1 & 2. pp. 111–118. [4 refs.]

These observations were made at the Moravian Mission Hospital, Sikonge, south of Tabora, Tanganyika Territory, and are, as the author says, incomplete. In all cases but one trypanosomes were found in the blood, and so easily that gland puncture was abandoned. The infective agent is believed to be *T. rhodesiense*.

"The commonest symptoms are headache and pain in the legs and arms, usually associated with rapid wasting . . . One case sought treatment for anaesthesia corresponding to the distribution of the left ulnar nerve; one for a large, painful swelling about the left elbow-joint; and one for irido-cyclitis with hypopyon. All of these conditions cleared up rapidly with no treatment other than that for sleeping sickness. The commonest sign was some enlargement of the axillary glands. Swelling of the feet and legs occurred in 50, and enlargement of the spleen in 20 per cent. of the cases. Marked lethargy of long duration is rare in untreated cases." [The ease with which trypanosomes were found in the blood and the character of the symptoms are confirmatory of *T. rhodesiense* infection.]

Of a series of 53 cases in which lumbar puncture was done before treatment only 2 had a normal C.S.F. and both of these were seen within a week of the onset of symptoms; 37 of the 53 had trypanosomes in the C.S.F., with in some instances a cell count as low as 4 or 10 cells per cmm.

Eight cases were treated with tryparsamide, 8 or fewer weekly injections of 3 gm., with very unfavourable results. In 3 instances trypanosomes reappeared, in 3 the condition changed for the worse, one patient improved but complained of constant headache. One man received 35 gm. in 14 days and died a week later.

Seven cases were treated by "Bayer" followed by tryparsamide. The table shows much better results—4 patients were very fit after

6 or more months—but 2 others were totally and one nearly blind, after totals of 24 and 21·5 gm. tryparsamide.

Nine cases were treated with "Fourneau 309," believed to be identical with "Bayer 205;" albuminuria appeared in each case, but cleared up later. The results were good after 3 to 6 months.

Twenty-six cases were treated with "Bayer 205" Four died of the disease and one relapsed. Otherwise the results appear good (the period of observation is in most 3–4 months). 5 gm. was the maximum amount given. The author expects a large percentage to relapse.

Conclusions :—

"1. In *Trypanosoma rhodesiense* infections tryparsamide fails to sterilize either the peripheral blood or the spinal fluid, and produces very little immediate physical improvement.

"2. Immediate physical improvement usually follows treatment with 'Bayer 205,' with sterilization of the peripheral blood and disappearance of trypanosomes from the spinal fluid.

"3. The place of tryparsamide is in the treatment of those cases which have relapsed after treatment with 'Bayer 205'; or, ideally, in the subsequent treatment of all cases in which the spinal fluids fail to return to normal.

"4. Previous treatment with "Bayer 205" greatly increases the risk of visual disturbance and blindness, and subsequent treatment with tryparsamide should be postponed for at least ten weeks, even if the urine gives no indication of renal changes being still present.

"5. The immediate results obtained with the drug which FOURNEAU, TRÉFOUEL and VALLÉE have designated '309' are at least as good as those obtained with 'Bayer 205.'

[See also DYE, p. 894.]

A. G. B.

MARSHALL (C. H.) & VASSALLO (S. M.). **A Final Report on the Treatment of Trypanosomiasis in Uganda.**—*Jl. Trop. Med. & Hyg.* 1926. Mar. 15. Vol. 29. No. 6. pp. 85–89.

The last report of these authors was fully noticed in this *Bulletin*, Vol. 20, pp. 331–5. They have since announced that their method of treatment in another area, the Nile district, in April and May, 1922, was far less successful. They realize the importance of classing their cases and suggest a classification which is, briefly, as follows: A, The onset; blood infection; B1, gland enlargement; B2, onset of nervous symptoms; B3, nervous symptoms more advanced; somnolence; C, "true sleeping sickness." "Classification must be based upon the clinical picture as a whole." [In the present state of knowledge no classification which ignores the condition of the cerebrospinal fluid can be satisfactory.] They believe that except in the "A" class trypanosomes are rare in the peripheral blood stream, give some figures in support and say "if trypanosomes are only found in the blood of early cases it may be presumed that this is the class of patient mainly responsible for infecting the fly."

[It is singular that so little experimental work has been published on this subject. We know that human patients are not infective to fly unless the short forms of the trypanosome are present in the blood, and it has recently been stated (REICHENOW, this *Bulletin*, Vol. 21, p. 54) that tsetse can rarely be infected from patients at an advanced stage of sleeping sickness. A careful series of experiments is needed, for knowledge thus obtained would have much practical importance.]

A table is given of 214 cases treated by 17 methods, in ten of which the number of cases varies between one and seven, the patients being classified under B1, B2, and B3. Excepting one form of treatment (intravenous arsenic) "all cases showed 100 per cent. positive results when re-examined after 12 months." From a tabular statement it appears that of 40 which received intramuscular salvarsanized serum (as well as intravenous arsenic) 12 were "alive and well" and of 48 which received intrathecal salvarsanized serum (and intravenous arsenic) 26 were "alive and well" after 12 months. [The figures are expressed as percentages for each stage.] After 22 months only 25 of the 214 were alive and well, but of the 25, 20 had been treated with intrathecal serum.

The patients treated in the Mbale district were re-examined in September, 1924 [see table in this *Bulletin*, Vol. 20, p. 334.] Of the 27, 5 had died and one case relapsed, and 21 remained alive and well, and gland and blood examination were negative, though from 3½ to 6 years had elapsed since they were found to be infected. The authors naturally sought the reason of the difference in curability between the Mbale and Madi natives. They find a twofold difference. In Mbale there was no risk of reinfection; in Madi *palpalis* abounded on every stream. In Madi, yaws, syphilis, ulcers, etc., are wide-spread and the result of examination of the stools of 35 unselected natives was to show ankylostomes in 63 per cent. and other parasites in smaller proportion pointing to debilitating influence [but nothing is said of the infections or intestinal fauna of Mbale natives.] In a few cases they had good results from the use of tryparsamide.

A. G. B.

VAN DEN BRANDEN (F.). Le stibosan "préparation Heyden No. 471" dans le traitement de la trypanosomiase humaine. [**Stibosan (Heyden 471) in the Treatment of Human Trypanosomiasis.**] — *Bull. Soc. Path. Exot.* 1926. Mar. 10. Vol. 19. No. 3. pp. 193–196. [1 ref.]

For the composition of stibosan see page 483 of this volume. Whereas the allied compound stibenyl does not seem of value in the treatment of human trypanosomiasis [*loc. cit.* Vol. 19. p. 881], stibosan is effective. Five patients were treated with a series of ten injections by the veins. Details are given. The trypanocidal action is less rapid than that of tartar emetic, to which it does not seem superior for chronic cases. The experiments are still in progress.

A. G. B.

BERGER (E.). Zur Kenntnis der trypanoziden Wirkung von "Peracrina 303." [**The Trypanocidal Action of "Peracrina 303."**] — *Deut. Med. Woch.* 1926. Mar. 5. Vol. 52. No. 10. pp. 394–395. [4 refs.].

Peracrina is a trypaflavin-albumen combination which contains 10 per cent. of trypaflavin; it has been used recently on a considerable scale for the treatment of malaria in Russia. In this note Berger describes his observations on the therapeutic action of the drug on mice infected with nagana. Experiments showed that, although in some cases mice of 20 gm. could tolerate feeding with 100 mgm. or even 150 mgm. of peracrina, the dose tolerated could be estimated at 50 mgm.

Comparative experiments on mice infected with nagana Prowazek and treated with 50 mgm. of peracrina on the one hand and 5 mgm. of trypaflavin on the other showed that trypaflavin gave much the more satisfactory results; the peracrina caused the disappearance of trypanosomes from the blood, but the parasites quickly reappeared and the animals died, whereas in those animals treated with 5 mgm. of trypaflavin there was no relapse within the observation period of 29 days.

W. Y.

KUHN (Philalethes). Weitere Mitteilungen ueber die Wirkungen der verschiedenen parenteralen Einverleibungsarten löslicher Antimonsalze bei der Durineinfektion der Maus. [**The Effects of Different Methods of Parenteral Administration of Soluble Antimony Salts on Dourine Infection in Mice.**—*Arb. a. d. Reichsgsdhtsamt.* 1926. Vol. 57. pp. 733–745. [5 refs.]

In a previous paper on dourine infection in mice the author showed that for tartar emetic, antimosan and Heyden 488 and 471 subcutaneous administration is superior to other parenteral methods, and the intramuscular route superior to the intravenous and intraperitoneal. The experiments on antimosan have been continued and others on stibenyl instituted. The antimony salts were dissolved in water and the quantity of solvent was varied. The protocols are given and several tables.

The results were as follows: With the quantity of stibenyl employed dourine-infected mice were not cured except by subcutaneous administration, which brings this drug into line with those named above. Though stibenyl is more effective subcutaneously it is not more toxic to the mouse. With antimosan the results of SCHNITZER were confirmed; the trypanosomes disappear after an hour and sooner than when the drug is introduced by other channels.

A. G. B.

LAUNOY (Léon) & NICOLLE (Pierre). Documents pour servir à la détermination chez la souris des constantes de toxicité et d'activité trypanocide du novarsénobenzol. [**Data for the Determination in Mice of Constants of Toxicity and Trypanocidal Activity of Novarsenobenzol.**]—*C.R. Soc. Biol.* 1926. Sept. 21. Vol. 95. No. 27. pp. 614–616. [1 ref.]

Constant of Toxicity.—Numerical data are given to show that the lethal dose of arsenobenzol per kilo. for mice varies from 0·35 gm. to 0·45 gm., and the dose tolerated lies between 0·30 and 0·425 gm., these figures appearing to show that the sensitivity of the mouse to intravenous injections of novarsenobenzol is less than that of the rabbit.

Trypanocidal Activity.—This was studied with *T. equiperdum* and *T. brucei* from the Institut Pasteur, Paris. The data show that a virus fixed for the mouse, such as the strain of *T. brucei* in question, is very sensitive to the trypanocidal action of novarsenobenzol. But *T. equiperdum*, the virulence of which is variable, shows itself more resistant to the drug. From this we may conclude, they write, that there is not "a" trypanocidal action of novarsenobenzol, but several trypanocidal actions. They think that this point has been insufficiently stressed.

A. G. B.

LEWY (F.) & GUREWITSCH (M.). Gewinnung und Eigenschaften von parafuchsinfesten Trypanosomen. [**The Production and Properties of Parafuchsin-fast Trypanosomes.**]—*Ztschr. f. Hyg. u. Infektionskr.* 1926. Sept. 11. Vol. 106. No. 3. pp. 532–537. [10 refs.]

Conclusions.—(1) A trypanosome strain (Nagana, Prowazek) made fast experimentally to parafuchsin has *in vivo* a maximal insensitiveness to this dye with both subcutaneous and oral administration. (2) The fastness is specific: salvarsan, trypaflavin, tartar emetic and "Bayer 205" have the same action on the parafuchsin-fast strain as on the normal strain. (3) In contrast to the strain described by ROEHL* the parafuchsin fastness produced extends also to the more active tryparosan (chlorinated parafuchsin). On the other hand, the feeble trypanocidal action of two ethylated or methylated Triphenylmethane dyes (brilliant green and pyoktanin) on the fast strain is of importance.

A. G. B.

EDWARDS (J. T.). **The Chemotherapy of Surra** (*Trypanosoma evansi* **Infections) of Horses and Cattle in India.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1926. Mar. 18 & May 20. Vol. 20. Nos. 1 & 2. pp. 10–71. With 1 diagram, 2 figs. on 1 plate & 12 charts. [97 refs.]

This paper is, of course, of chief interest to veterinarians, but it should be read by all concerned with the treatment of human trypanosomiasis. As regards horses, the author found "Bayer 205" superior to tartar emetic, bismuth compounds and tryparsamide. The following passage will doubtless find its application in the disease of man:—

"The lack of diffusibility of the drug ["Bayer 205"], however, operates adversely in one important respect, namely, in that it is unable to penetrate the subarachnoid space in trypanocidal concentration; hence, although prolonged sterilization of the circulatory system may be effected by the administration of a single intravenous dosage, in well-established cases of infection the trypanosomes meanwhile multiply, as has been proved by experimental observations, in the safe retreat afforded by the cerebrospinal canal, and the animal may ultimately succumb from surra affecting purely the central nervous system. This defect may be counteracted by the introduction of 'Bayer 205' simultaneously with the intravenous injection, intrathecally, in very dilute solution, in a dosage arithmetically equivalent to that introduced intravenously having regard to the relative weights (about 1 : 500) of the tissues affected by the introduction of the drug into the two channels."

In the treatment of man intrathecally the dosage seems to have been always calculated on the total weight or blood volume.

A. G. B.

HALFER (Giuseppe). Sulla chemioterapia moderna della tripanosi. **Modern Chemotherapy of Trypanosomiasis.** *Arch. Ital. Sci. Med. Colon.* Tripoli. 1925. Sept.–Oct. Vol. 6. No. 9–10. pp. 118–123. [37 refs.]

The effect of "Bayer 205" on trypanosomes varies with the strength of the drug. After injection of a 7·5 per cent. solution the parasites

* *Ztschr. f. Immunitätsf. u. Experim. Therap.* 1908. Vol. 1. p. 70. Tryparosan caused the trypanosomes to disappear for some days in the case of a strain which by three years' treatment had been made as resistant as possible to parafuchsin (see *Sleeping Sickness Bulletin.* Vol. 1. p. 156).

lost all motility in 20–25 minutes; with a 10 per cent. solution within 5 minutes; above 10 per cent. trypanolysis resulted. In animal experiment, infected rats after injection of a 1 : 20,000 solution (0·5 cc. per 20 gm. body-weight) never showed any subsequent relapse; with a solution of 1 : 40,000 relapses occurred. A single dose, therefore, if of the right strength, can bring about a "sterilisatio magna."

As regards the results in sleeping sickness: In the first period, that of fever, erythema and oedema, lasting cure is nearly always effected by three injections (on the 1st, 10th and 27th days of the month) of 1·2 gm. in 5 cc. normal saline. In the second period, of glandular enlargement, the same procedure is recommended. In the third, that of tremor, paresis, hyperaesthesia, the course should be repeated after an interval of a month.

H. Harold Scott.

KRAUS (R.). Die Chagaskrankheit, Kropf und Kretinismus in Südamerika. [**Chagas Disease, Goitre and Cretinism in South America.**]—*Wien. Klin. Woch.* 1926. Apr. 1. Vol. 39. No. 14. pp. 378–382.

In this paper the view of CHAGAS that goitre in Brazil is a symptom of trypanosomiasis is combated and the objections to this and other statements of CHAGAS are set down with full illustration and argument. As the paper has interest as well as importance it must be treated in some detail. CHAGAS maintains the theses that where there are no Triatomas in the houses there is no goitre, that in Brazil there are no trypanosomiasis districts where goitre is not found, and that endemic goitre and Chagas disease are the results of infection with trypanosomes which are conveyed to man by Triatoma.

The author with his colleagues has been studying this question in Argentina for some years and has reached the following conclusions: (1) In the mountain districts of Argentina there are Triatomas (*T. megista*) infected with *T. cruzi*. In some parts of these districts goitre and cretinism are found corresponding with the classical picture of these affections in Europe; acute cases of Chagas disease have not been established either clinically or experimentally. (2) In the Chalchaqui valley in the same region neither goitre nor cretinism is found in spite of a large number of infected bugs. (3) Nor are these affections met with in the provinces of Buenos Aires and Cordoba though infected Triatoma occur there also. (4) In Argentina infected Triatoma produced neither acute nor chronic Chagas disease.

He refers to MÜHLENS' discovery of two cases of trypanosomiasis in Tucuman and Jujuy provinces [see this *Bulletin*, Vol. 22, p. 621], and to a third case recorded by DIOS, ZUCCARINI and OYARZABAL [*ante*, p. 426], all in children. None of these had the symptoms of acute Chagas disease.

The author goes on to the question of the occurrence of Chagas disease in other South American countries. CHAGAS's own investigations were made in a mountainous district of Minas Geraes and none have been made in the plains. CARINI and MACIEL, in the adjacent State of São Paulo inoculated several guineapigs with the blood of persons suspected of trypanosomiasis and in the muscles of one animal found cyst forms; BAYMA describes a case in the same State. With these exceptions no cases of Chagas disease have been described in Brazil since the original investigation of 1909. In other States the disease has been sought but not found. So that there is a contradiction between the frequency of infected bugs and the rarity of the

disease, which the author says is new to him in the epidemiology of insect-transmitted disease. He does not mention what is perhaps an analogous case, the occurrence over wide areas of infected *G. morsitans* and the comparative rarity in man of infection with *T. rhodesiense*.]

ESCOMEL'S case of human trypanosomiasis in Peru is mentioned, and the improbability of the parasite being *T. cruzi* (this *Bulletin*, Vol. 15, p. 384; Vol. 16, p. 368), and 2 cases of TEJERA in Venezuela, the details of which the author has not seen. [Three cases are recorded in children of 9 months and 2 years, and a girl of 17; in one instance the parasites were "morphologically identical" with *T. cruzi*, *l.c.*, Vol. 15, p. 384.]

From the clinical side it is difficult to distinguish endemic goitre and cretinism from the clinical picture of the acute and chronic infections depicted by CHAGAS. According to MUNK, in the district where CHAGAS made his discovery, 75 per cent. of the indigenous population have goitre and every family its cretin, dwarf or paralytic. It is questioned whether these conditions are due to the trypanosomiasis, and another difficulty is that in the chronic form of Chagas disease trypanosomes are no longer found in the blood. It follows that Chagas disease and endemic goitre overlap in their distribution. An endeavor should be made to find cases of trypanosomiasis in regions of Brazil or Argentina free from goitre and where infected Triatoma are present. Kraus seems to have made out a good case for further enquiry into American trypanosomiasis.]

A. G. B.

CHAGAS (C.). Quelques aspects de la trypanosomiase américaine. [**Some Aspects of American Trypanosomiasis.**] *Rev. d'Hygiène.* 1926. Aug. Vol. 48. No. 8. pp. 694–702.

The bulk of the paper is occupied by a general description of the disease such as may be found in text-books.

Neurotropic strain of *T. cruzi*.—This strain was obtained by the inoculation to dogs of trypanosomes found in the armadillo (*Tatusia novemcincta*). The dogs almost invariably become paralysed. The parasite is found in the central nervous system and the inflammatory lesions correspond exactly with the motor symptoms; the lesions resemble closely those observed in the disease in man. The neurotropism is maintained in successive passages through laboratory animals as well as in artificial culture up to the 70th generation. It is preserved also after passage through the insect transmitter. It is not a matter of occasional paralyses such as may occur with any trypanosome infection, but of their constant occurrence. The strain is a very virulent one, giving rise to intense infection in animals. Crossed immunity experiments have shown that inoculation of the neurotropic strain immunizes completely against the human strain, but infection by the human strain confers only a relative immunity against the neurotropic strain, and in these animals one does not see the nervous manifestations.

Hereditary transmission of *T. cruzi*.—VILLELA has demonstrated the presence of *T. cruzi* in the heart and nervous system of the new-born puppies of an infected bitch; cysts of the parasite were found in the placenta and uterine decidua. It is doubtful whether true heredity occurs, i.e., by infection of the spermatozoa and ova; transmission is

more probably effected by contagion in utero. Intra-uterine transmission explains the frequency of cerebral diplegia in this disease, for meningo-encephalitis is rare.

Host of *T. cruzi* in nature.—The demonstration of the trypanosome in the armadillo's blood is of much importance. The armadillo is found throughout S. America in burrows far from or near human habitation. In the burrows was found *Triatoma geniculata*, a species allied to *T. megista*, containing forms of the trypanosome, and the inoculation of these parasites to animals produced infections identical with those produced by inoculation from man. The armadillo is evidently the primitive host. When the armadillo abandons its earths, the bugs come sometimes to human habitations. The parasite in the armadillo is found in the same situations and produces the same lesions as it does in man.

A. G. B.

MAZZA (Salvador). Caso de esquizotripanosis humana observado en la ciudad de Jujuy. (Nota preliminar). [**A Case of Human Trypanosomiasis in Jujuy City.**]—*Bol. Inst. Clin. Quirurg.* Buenos Aires. 1926. Apr. No. 11. 6 pp. With 3 figs. & 2 coloured figs. on plates.

——. Cas de trypanosomose humaine observé dans la ville de Jujuy.—*C. R. Soc. Biol.* 1926. Sept. 21. Vol. 95. No. 27. p. 815.

The author says that four cases of *T. cruzi* infection, all in children, have been recorded in Argentina. In the study of the malarial index in 507 persons in the town of Jujuy *T. cruzi* was found in thick drop in the blood of a woman aged 27. Citrated blood was inoculated to 2 mice and 2 guineapigs, and 17 days later in one of the mice a few trypanosomes were seen. The patient had a visible goitre, slight exophthalmos, pulse 110 of low tension, asthenic habit, emaciation, pallor of mucosae, enlarged liver and spleen; there was no oedema or myxoedema, and no gland enlargement. A month later trypanosomes were not seen in the blood, but subtertian gametocytes were present. There was melanoderma of the face and Sergent's white line (probable suprarenal implication). She was suckling a child of 6 months, whose blood did not show trypanosomes. A girl of 4 years had a goitre, facial myxoedema and moderate splenomegaly, and subtertian gametocytes, but no trypanosomes. A child of 2½ had a large spleen, numerous schizonts and gametocytes (subtertian), but no trypanosomes. In the patient's house were found Triatoma, the posterior intestine of which contained "flagellates of the metacyclical trypanosome type." In the first paper there are photographs of the patients and good coloured plates of the trypanosome.

A. G. B.

URIBE (Cesar). **A New Invertebrate Host of *Trypanosoma cruzi* Chagas.**—*Jl. Parasit.* 1926. June. Vol. 12. No. 4. pp. 213–215. With 1 text fig.

The summary runs as follows:—

"An adult female *Apiomerus pilipes* Fabr., was found in association with *Rhodnius prolixus* in a shack near Trujillo, Venezuela, S.A. This Reduviid, which fed readily upon *Rhodnius prolixus* Stahl, and also upon *Musca domestica* Linn., refused to suck blood from newly-born white rats, and also from man.

"Dying after several feedings upon body juices and apparently upon the intestinal contents of *Rhodnius prolixus* which contained *Trypanosoma cruzi*, its intestinal contents showed a very heavy infection with flagellates morphologically identical with the forms of *T. cruzi* found in *R. prolixus*. Daily examination of its feces had not shown flagellates of any description.

"While little was learned of the biology of *A. pilipes*, it is clearly indicated that it feeds upon *Rhodnius prolixus*, with which it was found associated, rather than upon vertebrates, and that it may serve as a host of *Trypanosoma cruzi*."

A. G. B.

KROÓ (H.). Weiterer Beitrag zur Immunbiologie der Trypanosomen. Zur Kritik des Kreuzinokulationsverfahrens als immunbiologische Methode der Artabgrenzung. [**Crossed Inoculation as an Immunobiological Method of Distinction of Species.** *Ztschr. f. Hyg. u. Infektionskr.* 1926. Mar. 18. Vol. 106. No. 1. pp. 77–82. [2 refs.]

The author has recently discussed the difficulties of separating the species of the pathogenic trypanosomes. Two methods have been advised, that of crossed immunization introduced by LAVERAN, and that proposed by KLEINE in which the trypanosomes of a naturally infected animal are introduced, if possible without mediate passage, directly into as many animal species as possible. In the diagnosis are considered both the morphology and the natural pathogenicity. In the work referred to three laboratory strains of *T. brucei* of different origin, when compared in such an experiment, behaved differently, as if they were three separate species. The author describes LAVERAN'S method and gives an excerpt from a paper written by him in 1907, in which a goat infected with *T. pecaudi* was judged to have become immune to that species, because sensitive subinoculated animals ceased to become infected, but was afterwards infected with *T. dimorphon* with the conclusion that *pecaudi* and *dimorphon* are different species. The author remarks that *T. dimorphon* was originally obtained by DUTTON and TODD from a horse in Gambia (not Senegambia), was maintained in experimental animals for three years in Paris, and finally examined in a sheep for its specific identification.

In the author's own experiments a strain of *T. brucei* "Prowazek" was inoculated from a mouse subcutaneously into an ox, two sheep, a dog, a rabbit and a guineapig. Four weeks later, blood was taken from each animal and put back into mice, which received such a dose of arsacetin on two consecutive days as sterilized their blood. They were then inoculated in groups of six with the same and each of the other strains. The experiments were fully controlled. The result was that all the strains compared with one another and with the original mouse strain in the crossed immunity experiments were different. Thus mice which were immune to the ox strain were reinfected by the sheep, dog, rabbit and guineapig strain and so forth. Two tables are given in illustration: 36 mice were employed in each. Moreover, even the two sheep strains were shown to be immunologically different. The results show that LAVERAN'S method for identification of species must be used with great caution. KLEINE'S view is that strains met with under natural conditions are relapse strains; trypanosomes introduced by the bite of the tsetse are at once modified by the body defences.

A. G. B.

LANDSTEINER (K.) & VAN DER SCHEER (J.). **Experiments with Trypanosomes in Relation to the Wassermann Reaction.**—*Proc. Soc. Experim. Biol. & Med.* 1926. May. Vol. 23. No. 8. pp. 641–644. [6 refs.]

One set of rabbits was treated with dead trypanosomes, another with a small dose of living trypanosomes (? *T. equiperdum*). A table records the Wassermann results one month after infection, or after 4 to 7 injections of dead trypanosomes. Strong reactions were obtained in each instance, and it is noted that dead trypanosomes are powerful agents for inducing the formation of Wassermann reagins.

A. G. B.

CHU-JEN KU. Ueber Komplementbindungsreaktionen bei Kaninchen-Trypanosomiasis. [**Complement Fixation Reactions in Trypanosome Infection of Rabbits.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1926. Apr. 8. Vol. 47. No. 1. pp. 17–39. [51 refs.]

The many details of a careful investigation given in this paper hardly permit of useful abstract. The author recounts the observations of many (named) investigators, establishing the close similarity in the symptoms, and lesions of skin and nervous tissues, of men and lower animals, infected with syphilis and trypanosomiasis respectively. Many workers have demonstrated a positive complement fixation reaction in the serum of rabbits infected with syphilis and with different trypanosomes respectively. Such a serum reaction has been shown also to occur in the *mal de coit* of horses. A careful précis of these various observers' experimental results and observations is given. Full details are given of the author's own experiments, with tables setting out his results. Following Von DAHMEN's technique for *mal de coit* of horses, the author found that with very exact titration of reagents, and the use of an alcoholic-trypanosome extract as antigen, while no unspecific positive reactions were given by the blood serum of healthy rabbits, the blood serum of trypanosome infected rabbits constantly gave a positive reaction.

H. M. Hanschell.

NEUMARK (Eugen) & POGORSCHELSKY (Herbert). Die Bedeutung der trypanociden Wirkung des Blutserums von Säuglingen. **The Significance of the Trypanocidal Action of the Blood Serum in Sucklings.**]—*Ztschr. f. Kinderheilkunde.* 1925. Dec. 31. Vol. 40. No. 5. pp. 535–551. [14 refs.]

The work described in this paper is along the same lines as that of ROSENTHAL and FREUND and others previously noticed in this *Bulletin*, (Vol. 20, p. 700 ; Vol. 22, p. 143). The conclusions, which confirm those of the earlier workers, are as follows :—

1. Healthy sucklings in the first week of life have no observable amount of trypanocidal substance in their blood serum.
2. As age increases trypanocidal substances appear in the blood serum, and, as a rule, they are well-developed between the eleventh and fifteenth week of life.
3. If the children become ill with any febrile infection, a decrease in the trypanocidal power of the serum is demonstrable.

4. Weakly children exhibit a corresponding decrease in the trypanocidal power of the blood serum.

5. In some cases of pronounced Barlow's disease and of premonitory cutaneous haemorrhages the established diminution in the trypanocidal substances was due to accompanying, or shortly preceding, infections.

W. Y.

NAMIKAWA (Hiroshi). **An Experiment on Congenital Infection with** *Trypanosoma.*—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1926. Jan. No. 250. English summary pp. 6–7. [In Japanese.]

Three pregnant mice were inoculated with a strain of *T. gambiense* which had been maintained in mice; after 3 days, the animals were killed and the uterus, placenta, and embryo examined for trypanosomes in smears and sections. All were found to be infected, and consequently it is concluded that congenital infection can take place.

W. Y.

SCHUBERG (A.) & BÖING (W.). Ueber den Weg der Infektion bei Trypanosomenerkrankungen. [**The Track of Infection in the Trypanosomiases.**]—*Arb. a. d. Reichgsndhtsamt.* 1926. Vol 57. pp. 785–800. With 4 text figs. [29 refs.]

In 1913 these authors showed that when blood containing trypansomes (*T. lewisi* and *brucei*) is inoculated intracutaneously into an experimental animal the parasites quickly pass into the lymph spaces of the corium, multiply in these and the subcutaneous connective tissue, and so reach the neighbouring lymphatic glands where they increase abundantly; they are demonstrable in the glands of the same side of the body in large numbers before they are found in the blood. It was concluded that these species are to be regarded not only as blood parasites, but in no small degree and primarily as parasites of the lymphatic system (this *Bulletin*, Vol. 2, p. 126). Here they go more fully into the matter, give some instructive illustrations and oppose the dictum of REICHENOW that the blood is primarily affected and afterwards the lymphatic system [*l.c.*, Vol. 21, p. 54].

An area of skin of about one square centimetre was penetrated by some 20 pricks of the finest entomological needles, drops of trypanosome-containing blood mixed with equal parts of 5 per cent. citrate solution were left in contact with it for 5 to 30 minutes, the rat was killed and the piece of skin fixed, embedded and sectioned. After staining by Giemsa the prick tracks could be recognized, and the behaviour of the trypanosomes determined. In other instances, by means of fine cannulas intracutaneous injections were made, in imitation of the natural introduction by insect bite, into the corium, though it was not always possible to exclude contamination of the subcutaneous tissue. Animals were killed daily for examination. The *T. lewisi* experiments, which are described separately, were made by both methods; the *T. brucei* experiments by the intracutaneous method. The result of the latter after inoculation in the right thigh was infection of the glands in regular and unvarying order right inguinal, right axillary, left axillary, left inguinal; later after 3 days, trypanosomes could be found in the tail blood. By gland infection is understood infection of the lymph spaces, not of the contained blood

vessels. All the experiments showed that the spread of infection from the place of inoculation takes place in the first instance by the lymphatics.

The remainder of the paper concerns REICHENOW's objection to their former work, and his criticism that their method of inoculation does not correspond with the natural method, which consists in the sinking of the proboscis into a blood vessel and the escape of parasites into the blood. They do not concur and they maintain their view that at the commencement of infection the trypanosomes of these species are primarily parasites of the lymphatic system.

A. G. B.

BATTAGLIA (Mario). Experimentelle Nephritis und Hepatitis durch *Trypanosoma brucei*. **Nephritis and Hepatitis from the Experimental Inoculation of** *T. brucei*. *Cent. f. Bakt.* I. Abt. Orig. 1926. Aug. 20. Vol. 99. No. 6. pp. 468–469. [6 refs.]

A short paper in which the author describes lesions of the kidney and liver in rabbits injected in series with a strain of *T. brucei*.

A. G. B.

IVANOFF (E.). Le sort des trypanosomes (*T. brucei* et *T. pecaudi*) dans la cavité générale de *Galleria mellonella*.—*C. R. Soc. Biol.* 1925. Aug. 14. Vol. 93. No. 27. pp. 571–572. [1 ref.].

LEGER (Marcel). La maladie du sommeil dans nos colonies de l'Afrique equatoriale.—*Paris Med.* 1926. Feb. 13. Vol. 16. No. 7. pp. 154–155.

STEUDEL. Die Schlafkrankheit in Togo – ein deutscher Bluff ?—*Der Kolonialdeutsche.* 1926. Vol. 6. No. 9. p. 141–142. With 1 fig.

TROPICAL OPHTHALMOLOGY:

A REVIEW OF RECENT ARTICLES.—VI.*

THE CONJUNCTIVA.—R. E. WRIGHT[1] has reported a case of an obscure conjunctival inflammation which bore some resemblance to Parinaud's conjunctivitis. The patient was a Hindu, aged 32, and occupied as a fireman on a railway engine. A month previous to admission to hospital the affected eye had been injured by a spark from the furnace. There was a history of syphilis; and, though a von Pirquet test was positive, clinical signs of any tuberculous lesion were absent. The conjunctival lesion showed large, coarse, polypoid granulations with greyish-yellow areas free from ulceration. Eventually the granulations invaded the cornea and destroyed it. Except for a temporary enlargement of the preauricular gland there was no sign of lymphatic involvement. Constitutional symptoms, too, were negligible. Anti-syphilitic and anti-tuberculous treatments were of no avail.

G. R. HARE[2] met with a case of subconjunctival echinococcal cyst. It appeared as a globular, greyish, cystic tumour about the size of a pea, and was situated over the insertion of the internal rectus muscle. The overlying conjunctiva was slightly injected but quite freely moveable. The cyst was removed through an incision in the conjunctiva, and was proved by pathological examination to be echinococcal.

P. DURAND and UGO LUMBROSO[3] state that the Koch-Weeks bacillus bears the closest analogy to the Pfeiffer bacillus, and that the bacteria can be differentiated neither by their morphology nor even by their biochemical and serological reactions. The Weeks bacillus is pathogenic to the human conjunctiva only. It may be found in the normal conjunctival sac, and it may be present in trachoma, even when the disease is quiescent. Even after six years laboratory growth, experimental inoculation of the culture produces the typical conjunctival inflammation in man. Yet the possibility of a natural immunity is shown by the fact that an inoculation on two different individuals, made from the same stock, at the same time, and under apparently identical conditions, may be successful in one case and not in the other.

An epidemic of acute conjunctivitis, which occurred in Tucupita (Venezuela) during the season August to November, has been described by J. RHODE[4]. Staphylococci and streptococci were found in the discharge, but the origin of the disease remained obscure. There was much conjunctival injection, lachrymation, and a purulent discharge with oedema of the lids. The cornea was unaffected, and a lotion containing sulphate of zinc and adrenalin, with an ointment of one per cent. yellow oxide of mercury, cured the complaint in the course of a few days.

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* For the fifth of this series see Vol. 23, pp. 459–468.

1 WRIGHT (R. E.). Obscure Affection of the Conjunctiva resembling Cases of Parinaud's Syndrome.—*Arch. Ophthalm.* 1925. Sept. Vol. 54. No. 5. pp. 423–425.

2 HARE (George R.). A Case of Subconjunctival Echinococcus.—*Arch. Ophthalm.* 1926. July. Vol. 55. No. 4. pp. 367–369. With 3 figs. on 1 plate. [10 refs.]

3 DURAND (Paul) & LUMBROSO (Ugo). Quelques caractères du bacille de Weeks. Ses rapports avec le bacille de Pfeiffer.—*C. R. Soc. Biol.* 1926. June 4. Vol. 94. No. 19. pp. 1322–1323.

4 RHODE (Jesús). Observaciones oftalmológicas.—*Rev. Med. y Cirug.* Caracas. 1926. May. Vol. 9. No. 98. pp. 82–91.

Trachoma. The flow of literature concerning trachoma continues as freely as ever; but the problems of the disease remain unsolved. Hopeful features are: (1) there is evidence of a growing realization that diagnosis may sometimes present difficulties, and (2) there are occasional suggestions that the conjunctival changes associated with the condition may not in all cases be due to the same specific virus. Thus Ch. NICOLLE and U. LUMBROSO[5] note that a naturally granular state of the conjunctiva may be present in rabbits and in some other animals otherwise suitable for laboratory experiment. This condition, of course, complicates the question of experimentally produced trachoma; but the authors suggest that it may throw light upon the origin of the disease since such animals are specially exposed to contamination from the soil. The variability of the reaction produced in these animals by the inoculation of trachomatous matter obtained from human sources has led them to think that the virus in man may vary in its activity or in its nature. They suggest that the virus of trachoma may be telluric in origin, and may consist of different varieties one of which undergoes a special adaptation to the conjunctiva, and is then passed directly from eye to eye. Later, however, NICOLLE[6] insists upon the absolutely specific nature of the disease and states that the occurrence of other infections merely serves to draw attention to the presence of trachoma, which they do not cause. Considerable progress has been reported, especially by the French Colonial Authorities, in the prevention of the spread of trachoma by the use of propaganda and by inspections of the schools. One gathers from their reports that the disease, mostly of a mild type, is extraordinarily rife amongst schoolchildren in the French colonies. It is well to remember, however, that, in the eyes of young people, conjunctival changes associated with follicle formation may result from various kinds of irritation.

The forms of treatment recommended by most of the writers are mostly variations of old and well-known methods. But Madame E. DELANOË[7] has added another, viz. chaulmoogra oil, to the existing long list of remedies. She has found this most satisfactory, and claims that treatment for eight or ten days suffices to cure the worst cases, an immediate improvement following the first application. An irritating soapy matter forms in the conjunctival sac and this should be carefully sponged off with pledgets of wool soaked in a hot lotion. The treatment is said to be almost painless if this precaution is observed. She says that she found trachoma very rife in Morocco. Mohammedan children are heavily infected (40 per cent.), whereas Jewish children are much less so (5 per cent.). She attributes this to the fact that the Jews attend government schools where they are subject to medical inspection and good hygiene. Mohammedan children, on the other hand, are exposed to the worst possible conditions in their schools. The disease is much more prevalent amongst the Jewish adults than amongst their better cared for children. A. H. MILLET[8] considers that an acute stage of

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5 NICOLLE (Ch.) & LUMBROSO (Ugo). Origine et conception du trachome.—*Revue Internat. du Trachome.* 1926. July. Vol. 3. No. 3. pp. 71–74.

6 NICOLLE (Ch.). A propos d'un mémoire du Dr. F. Motais "Trois années d'Ophthalmologie en Indo-Chine."—*Revue Internat. du Trachome.* 1926. July. Vol. 3. No. 3. pp. 75–76.

7 DELANOË (E.). Etude sur le trachome au Maroc et son traitement.—*Bull. Soc. Path. Exot.* 1926. Jan. 13. Vol. 19. No. 1. pp. 49–62. [18 refs.]

8 MILLET (A. H.). La poussée aiguë de trachome.—*Arch. Méd. et Pharm. Milit.* 1925. Dec. Vol. 83. No. 6. pp. 540–542.

trachoma does occur, and that it is characterized by an acute inflammation of the anterior segment of the eyeball in which a serous iritis plays the chief part. Those observers who hold that an acute stage in trachoma mostly results from a secondary infection are unlikely to accept his conclusions in their entirety. An excessive use of atropine, such as he favours, may sometimes prove harmful and may increase the conjunctival irritation. The same writer[9] states that in Oran those persons in whom naso-pharyngeal adenoid tissue tended to persist to a late age were the most likely to be affected by trachoma. He argues that there is an intimate relation between trachoma and the presence of adenoid vegetations, and that trachoma is an inflammation of the palpebral adenoid tissue which is induced by repeated untreated, or badly treated, attacks of non-specific conjunctivitis in subjects whose adenoid tissue has failed to undergo involution.

NICOLLE and LUMBROSO[10] have recorded, rather more particularly than in the paper already referred to, the characteristics of certain granular changes common in the eyes of rabbits and of some small monkeys, and have remarked how easily such changes may be confounded with trachoma. It is stated that a follicular condition of the conjunctiva may be considered to be almost normal in some breeds. The follicles undergo marked development in response to even the mildest irritation. Simple scarification of an eye not only induces an intense folliculosis of the injured conjunctiva, but also affects the membrane of the other eye in the course of a few days. The authors conclude that: (1) only the chimpanzee and the baboon should be used for making researches on trachoma; (2) a study of non-trachomatous granular conditions of this kind may help to throw light on some of the problems presented by human trachoma; (3) the rabbit, an animal which is specially liable to follicular inflammation, is much exposed to ocular infections from the soil. The authors suggest that, though trachomatous infection may pass from man to man directly, or through the agency of flies, yet it also has affinities for the soil, and it may be hoped favourably to influence the spread of the disease by preventing infection from the earth.

FEIGENBAUM[11] has observed that in many cases of monocular trachoma there was some form of nasal disease on the affected side. Lowered nutrition was also present. Early nasal treatment is important in these patients.

B. F. ROYER[12] is inclined to support the view of J. A. STUCKY that diet deficiency may prove to be an important aetiological factor in trachoma. Arguing from the analogy of xerophthalmia he suggests that a deprivation, just insufficient to cause keratomalacia, may so injure the conjunctival resistance that common, mild causes of irritation can produce characteristic trachomatous pathological changes in the membrane. The influence of bad hygiene upon the spread of trachoma

9 MILLET (A. H.). Trachome et végétations adénoides.—*Arch. Méd. et Pharm. Milit.* 1925. Dec. Vol. 83. No. 6. pp. 543–548.

10 NICOLLE (Charles) & LUMBROSO (Ugo). La conjunctivite granuleuse du lapin et l'origine du trachome.—*C.R. Acad. Sci.* 1926. May 10. Vol. 182. No. 19. pp. 1116–1118.

11 FEIGENBAUM (Arieh). Ueber die Beziehungen des Trachoms zu Nasenleiden und die Frage des einseitigen Trachoms.—*Klin. Monat. f. Augenheilkunde.* 1925. Mar.–Apr. Vol. 74. pp. 392–403. [20 refs.]

12 ROYER (B. Franklin). Is Trachoma a Deficiency Disease? An Hypothesis for Public Health Consideration.—*Jl. Amer. Med. Assoc.* 1926. Aug. 1. Vol. 87. No. 7. pp. 482–485.

is demonstrated by the vivid description of conditions in Russia given by W. R. DEAR[13]. Prior to the revolution the old Russian government made a constant effort to increase and to improve ophthalmic hospitals, and paid particular attention to training ophthalmologists. But even then there was a dearth of facilities and from 17 to 33 per cent. of the population of the Volga basin was infected by trachoma. The ravages of the revolution, with the consequent elimination of the intelligentsia, and spread of famine and epidemic disease have rendered medical aid still more difficult to procure. The Chouvash Republic has a population of about one million, and 75 per cent. now suffer from trachoma. In some districts the entire population was affected. The author estimates that of this million persons, 75,000 are incapacitated from work by partial blindness caused by the disease. He found, however, that the peasants were surprisingly receptive to new ideas, especially those which concerned modern sanitation.

ROLLEMBERG SAMPAIO[14] reports that he has found ABADIE'S treatment (galvano-puncture of the upper fornix) to be most useful.

CORNEA.—SCHWARTZ[15] has reported a case of *keratomalacia* which presented some points of interest. The patient was an infant subject to intestinal disorder. It had been breast-fed, but for a period of twenty-two days its diet had been restricted to oatmeal water and Mellin's food. The ocular condition was typical and some cerebral symptoms were present. The diet was changed to whole lactic acid milk with orange juice and cod-liver oil. The latter was administered hypodermically in doses of 1 cc. Recovery took place with the loss of one eye. The author refers to McCOLLUM'S experiments which indicate that other factors in addition to the amount of fat-soluble A contribute to the causation of the disease; and that the total amount and composition of salt mixture are important. Clinical experience in South India rendered this evident to the reviewer many years ago; and it was believed that, in addition to the cod-liver oil, a mixture containing the chlorides of sodium, calcium, and ammonium was of value. Children, whose condition precluded the oral administration of cod-liver oil, were treated with inunctions, and, if breast-fed, by giving the oil to the mother. It is an interesting fact that children aged two years and over who were still being suckled appeared to be especially liable to the disease.

LENS.—*Cataract.* There is but little to record in connexion with this subject. A. E. DAVIS[16] has reported 187 cases of cataract treated by injections of lens antigen. It is claimed that the disease was arrested in 31·5 per cent., and arrested and improved in 52·2 per cent.; whilst 18·1 per cent. deteriorated. He gives a daily injection and increases the dose by half or 1 cc. until the full dose is reached, i.e., 8 cc. for a woman and 10 cc. for a man. Fifty doses constitute a course of treatment, so that the latter lasts for a period of about two

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13 DEAR (W. R.). Trachoma in Russia.—*Milit. Surgeon.* 1926. June. Vol. 58. No. 6. pp. 611–619. With 3 figs.

14 ROLLEMBERG SAMPAIO (J. M.). Tratamento do trachoma rebelde; methodo de Ch. Abadie.—*Sciencia Medica.* 1926. July 31. Vol. 4. No. 7. pp. 332–335.

15 SCHWARTZ (A. B.). Nutritional Keratomalacia. Report of Case.—*Jl. Amer. Med. Assoc.* 1925. Vol. 85. No. 26. pp. 2025–2027. With 1 chart in text. [21 refs.]

16 DAVIS (A. Edward). The Lens Antigen Treatment of Cataract, with a Further Report of Cases and Results.—*Trans. Ophthalm. Soc. of United Kingdom.* 1925. Vol. 45. Pt. 1. pp. 186–204.

months. If symptoms of intolerance appear, e.g., dizziness, pain or nausea coming on a few moments after the injection, the dose is lessened for about ten days and then again increased. Potassium iodide is given by the mouth during the course. KERR, HOSFORD and SHEPARDSON[17] are disposed to regard favourably the use of thyroid extract in the treatment of senile cataract. Having summarized the opinions of different observers with regard to the aetiology of the disease, they concluded that "senile cataracts represent the local degenerative changes in the lens of individuals who are the subjects of general degenerative disturbances." Thyroid extract improved the general health of most of the patients to whom it was given; whether the improvement in vision and the disappearance of lens opacities, which occurred in some cases, were caused by the better state of health or by a specific action on the lens of the thyroid substance, the authors are unable to state. Twenty-eight cases are recorded; of these 35·6 per cent. showed improvement; 35·6 remained unchanged; and 28·8 per cent. became worse under treatment. The authors recognize that it is very difficult to prove the value of any therapeutic procedure in the treatment of cataract, since some opacities may remain stationary for years, or may even clear up without any treatment. They suggest co-operation between physician and oculist in the interests of the patient.

H. V. WÜRDEMAN[18] has furnished particulars of three unfortunate cases of *choroidal haemorrhage after cataract extraction* which occurred in his practice. In only one of these cases was the eye apparently healthy, save for the cataract, previous to operation. This was a man, aged 71, on whom an extraction in the capsule was performed. Vitreous showed at the operation, but none was lost. On removing the bandage three days later haemorrhage was found to have occurred. The author states that in such cases the blood invariably comes from a ruptured choroidal vein, and that "microscopical examination of such eye balls shows hyaline degeneration of the retina; the vascular walls of the uvea partly thickened; liquid vitreous, and retinal vessels very narrow." He refers to the experiences of W. A. FISHER and H. T. HOLLAND regarding the effect of a high intraocular pressure in the causation of the complication.

GLAUCOMA.—H. HERBERT[19] believes that many chronic simple glaucomas arise mainly, if not entirely, from a defective inward pull upon the pectinate ligament. In many eyes the combined pull exerted by the ciliary muscle and the zonule is inwards as well as backwards, and this serves to keep the interspaces of the ligament open. But in other eyes the pull is almost entirely backwards; and these are in consequence liable to glaucoma. In some cases, too, the canal of Schlemm is situated more deeply in the sclerotic than is usual, so that the influence of traction on the inner layers of the pectinate ligament is lessened. R. E. WRIGHT[20] remarks that the bulk of

17 KERR (Wm. J.); HOSFORD (Geo. N.) & SHEPARDSON (H. C.). Treatment of Senile Cataract with Thyroid Extract.—*Endocrinology.* 1926. Mar.–Apr. Vol. 10. No. 2. pp. 126–144. [57 refs.]

18 WÜRDEMANN (Harry Vanderbilt). Expulsive Choroidal Hemorrhage after Cataract Extraction.—*Amer. Jl. Ophthalm.* 1926. June. Ser. 3. Vol. 9. No. 6. pp. 427–430. [11 refs.]

19 HERBERT (H.). A New Glaucoma Theory.—*Trans. Ophthalm. Soc. of United Kingdom.* 1925. Vol. 45. Pt. 1. pp. 333–355. With 9 text figs.

20 WRIGHT (R. E.). Section on Glaucoma of the *Administration Rep. Statistical Professional Rep. Govt. Ophthalmic Hospital, Madras, 1925* pp. 14–17.

the primary glaucoma cases seen in the Madras Hospital may be placed in the congestive group; in many, however, signs of congestion are very slight. A high general arterial pressure is rarely seen in association with the disease. Wright thinks it likely that some pathological change in the vitreous humour may be a determining factor in the causation of this type of glaucoma. In collaboration with NEWCOMB he has carried out an investigation into the crystalloid content of vitreous obtained from 22 cases of advanced primary glaucoma. The crystalloid content, however, showed practically no differences from the normal; and the result of the investigation is held to indicate that the rise in ocular tension is unlikely to be caused by a general increase in osmotic pressure in the vitreous. But it does not dispose of the theory that a swelling of the colloids, due to an increased adsorption of salts with a consequent increased osmotic pressure in the interstices of the colloid meshwork, may be a factor in the causation of the disease. Subconjunctival injections of adrenalin were found to have but little influence in this type of glaucoma.

OCULAR MUSCLES.—From his experience of a case in which the inferior rectus muscle was completely torn across by an injury, CRUICKSHANK[21] concludes that it is better to practise suture of an injured muscle as soon as chemosis and swelling of the lids have subsided rather than to postpone operation until the eye has become quiet. In the case referred to he waited for about nine weeks, and then found troublesome adhesions. Eventually, the patient did well and ceased to be troubled by diplopia.

ANAESTHESIA.—MARTIN D. ICOVE[22] advocates the use of intra-orbital injections of novocaine and adrenalin to induce a full anaesthesia, and employs the technique described by the GREENS. A 2 cc. syringe with a needle 5 cm. long is used; and from a half to 4 cc. of a 4 per cent. solution of novocaine, to which a little adrenalin has been added, is injected about half-an-hour before the operation is begun. The skin is painted with iodine and the puncture is made through the skin at the junction of the lower and outer border of the orbit, between the external and inferior recti. The needle is thrust in fully, being directed slightly upwards and inwards so as to avoid striking the floor of the orbit. The entire quantity of fluid is injected before the needle is withdrawn. The tissues of young people are more resistant than those of elderly persons. When inflammation is present a greater quantity of fluid is required and a longer interval must be left before operating. Half a cc. is used for an ordinary cataract extraction, but 3 cc. at least are necessary in the case of glaucoma or of enucleation. Intraorbital haemorrhage is said to be exceedingly rare. This technique does not preclude the necessity for cocaine instillations or for novocaine injections into the orbicularis.

GENERAL.—JARLAND[23], discussing the frequency and the causes of blindness in Yunnan, states that both trachoma and phlyctenular ophthalmia are very widespread and the causes of much loss of sight. The prevalent insanitary conditions and deficient or improper dietary

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21 CRUICKSHANK (M. M.). A Lesion of the Inferior Rectus: Treatment: Result.—*Indian Med. Gaz.* 1926. Aug. Vol. 61. No. 8. pp. 389–393. With 4 text figs. [2 refs.]

22 ICOVE (Martin D.). Intraorbital Anesthesia.—*Amer. Jl. Ophthalm.* 1926. Apr. Ser. 3. Vol. 9. No. 4. pp. 260–263.

23 JARLAND. La cécité au Yunnan. Ses causes et sa prophylaxie.—*Ann. de Méd. et de Pharm. Colon.* 1926. Jan.–Feb.–Mar. Vol. 24. No. 1. pp. 223–33.

favour the spread of constitutional diseases, such as smallpox, which are likely to be accompanied by ocular complications. Inoculation against smallpox is more popular than vaccination ; and this procedure endangers the sight of the subject and disseminates disease. Since blindness is so often due to a corneal opacity, much relief frequently may be afforded by an optical iridectomy. But seriously to lessen the number of blind people, it is necessary to attack the root causes.

For the prevention of blindness in China, E. Lossouarn[24] advocates widespread propaganda. A league has been formed in Tientsin to teach the danger of delay in seeking advice and the harm done by irritant applications to the eyes, and also to organize treatment centres. Posters, pamphlets, cinemas, and missionary centres are to be used to diffuse knowledge. Many causes of blindness are found in a country in which elementary hygienic principles are neglected, and conjunctival inflammations with secondary corneal complications play a large part. Dacryocystitis is common ; syphilis and smallpox, too, are responsible for much loss of sight. These conditions are much aggravated by dirty and irritant applications.

Reports. The Reports of the Madras Government Ophthalmic Hospital, dealing as they do with carefully recorded statistics concerning very large numbers of patients, are always of the greatest value and interest ; and that for the year 1925[25] is one of the best hitherto issued. 3,861 in-patients and 22,457 out-patients were admitted, whilst 3,258 operations were performed on in-patients and 1,283 on out-patients. The number of operations for *senile cataract* (1,359) is slightly lower than in previous years. This is accounted for ; (1) by restricted admissions due to financial stringency, and (2) by the fact that the hospital has now educated a considerable number of able surgeons and facilities for ophthalmic aid are therefore more widespread. Extraction with a complete iridectomy was performed on 889 patients, with a peripheral iridectomy on 185, and the simple operation on 126. A rather high rate of iris prolapse was experienced—7·8 per cent. including impactions. But it is not stated if this was influenced by the type of operation performed. The complication was treated by instillations of eserine and picric acid and by the use of the actual cautery when necessary. *Juvenile cataracts* (primary cataracts other than zonular occurring in patients under 25 years of age) are estimated to constitute 0·1 per cent. of out-patient admissions. Few *zonular cataracts* were met with. Blocking of the facial nerve at its exit from the stylo-mastoid foramen was practised on patients who lacked self-control. A special syringe (the Alston washerless syringe) is used. " The needle is pushed through the skin in front of the mastoid process and is directed backwards and upwards grazing the deep aspect of the mastoid process, just below the tympanic plate. When the point of the needle is in the digastric fossa in the neighbourhood of the stylomastoid foramen the injection is made."

2,232 cases of *refraction error* were treated. *Disease of the optic nerve* constituted nearly half the cases in which disability was caused by fundus disease.

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24 Lossouarn (Emile). La Prévention de la cécité en Chine.—*Presse Méd* 1926. June 9. Vol. 34. No. 46. pp. 731–733. With 5 text figs.

25 Madras. Administration Report, Statistics and Professional Rep. of the Govt. Ophthalmic Hospital, Madras for 1925. [Wright (R. E.).]—34 pp. With 14 figs. on 2 plates. 1926. Madras : Govt. Press.

It is stated that milk injections appeared to have some value in the treatment of *ulcus serpens* and of many inflammatory conditions of the eye.

A recrudescence of *macular keratitis* seems to have occurred during the year, and 109 cases of the disease were recorded. Slit-lamp examination proved the bulk of the opacity to be situated about the middle of the substantia propria. Swelling was present and this caused a curving of the anterior corneal layers and a bulging of the posterior surface into the chamber. Keratic precipitates were absent ; and any disturbance of the surface epithelium was rare. In no case could a breach of surface be demonstrated by staining. The other features, lack of irritation and vascular congestion, were as originally described, and the aetiology and treatment of the disease remain as obscure as ever.

Of 8,342 admissions to the out-patient department for conjunctival inflammations, 925 were due to *trachoma*, 2,192 to *Koch-Weeks infection*, 742 to *phlyctenular conjunctivitis*, 57 to *purulent ophthalmia* and 14 to *vernal catarrh*. The remarks concerning *glaucoma*, all varieties of which disease accounted for 314 admissions, have already been referred to.

The report also records some cases of special interest, amongst which are two cases of granuloma of the orbit caused by an aspergillus, and a peculiar form of epithelioma with cyst formation which occurred in a young subject. It furnishes eloquent testimony to the good work done in Madras by Major WRIGHT and his staff.

Another very valuable report is that of the Ophthalmic Section of the Egyptian Government for the year 1922[26]. It records many interesting facts and figures, and relates a history of progress which must be most gratifying to MACCALLAN and to all others responsible. In the year 1909 the total number of patients examined in the various ophthalmic hospitals in Egypt was only 22,273. The records show an almost continuous increase until, in the year under review, the number had reached 147,492. A most encouraging feature is the fact that more than half the necessary funds appear to be furnished by voluntary subscription. Turning to the report of the Clinical Section, glaucoma accounts for 1·7 per cent. of new admissions, and 969 operations were performed for the relief of this condition against 641 operations for senile cataract. This contrasts with conditions in India where senile cataract is probably at least three times as common as primary glaucoma. The great prevalence of serious conjunctival inflammatory disorders in Egypt may possibly be connected with this high incidence of primary glaucoma. Elliot's operation was that most often performed, and in this connexion the following paragraph may be quoted : " Secondary infections are extremely rare in Egypt, only 17 cases having been reported since 1911 out of 5,017 operations of trephining performed during this period."

The combined operation of extraction with iridectomy was the operation of election for senile cataract. In certain cases of complicated cataract a preliminary iridectomy was performed.

Conjunctival inflammations in Egypt reach their maximum frequency in June and July, the two hottest months, and gradually subside as the colder weather sets in. Membranous conjunctivitis is not uncommon, especially during the warmer months. It is stated that " it is quite impossible on clinical grounds to state whether or not a case of mem-

26 EGYPT. Ministry of the Interior. Dept. of Public Health. Tenth Ann. Rep. of the Ophthalmic Section, 1922.—48 pp. With 1 chart. 1926. Cairo : Govt. Press.

branous conjunctivitis is due to the diphtheria bacillus or not. Another equally important point is that microscopical examination with an oil immersion objective of a stained film of the conjunctival discharge is without importance as regards an exact diagnosis. In several cases in which animal experimentation fully showed that the condition of infection with the bacillus diphtheria was present a careful examination of the discharge only showed the presence of an organism resembling the gonococcus, the Koch-Weeks bacillus, etc."

The great value of efficient school medical inspection and treatment is demonstrated by the fact that 52 per cent. of the scholars were found to have an opacity on one or both corneae in the year 1913, whereas in 1923 this was reduced to 13 per cent. 110,469 cases of trachoma and 11,305 of gonorrhoeal ophthalmia were treated during the year.

Only 17 patients suffered from retinitis—albuminuric, diabetic and syphilitic; but 61 were admitted for retinitis pigmentosa, and 64 for detachment of the retina. 270 cases of optic atrophy are recorded. Disseminated choroiditis was found in 26 cases, choroido-retinitis in 18, and atrophy of the choroid in 63.

H. Kirkpatrick.

YAWS AND SYPHILIS.

GULATI (D. D.). **Yaws in the Chin Hills.**—*Indian Med. Gaz.* 1926. May. Vol. 61. No. 5. p. 228.

Exception is taken to a statement made by P. BELL (*ante*, p. 19) that cases of yaws were being treated as cases of syphilis, and some notes are given to show that the disease found among these hill dwellers is really yaws and not syphilis. Among the statements made are the following: "The primary sore may be present upon the angles of the mouth, the anus, or other parts, it has the appearance of a split pea"; "the primary sore may also occur on the finger tips"; "the tongue and fauces are not uncommon sites for the primary lesion in suckling infants." "In a few cases the secondary lesions [only eight cases of secondary disease seen] affect the mucous membrane of the mouth and fauces, sometimes even that of the tongue." [From such descriptions one is left in some doubt as to the real nature of the cases Sub-assistant Surgeon Gulati describes.]

H. S. Stannus.

DE ALMEIDA (Elpidio) & DE OLIVEIRA (Octavio). Algumas notas sobre a bouba na Parahyba—seu tratamento pelo "treparsol". [**Yaws in Parahyba—Treatment by Treparsol.**—*Brazil Medico.* 1926. Mar. 27. Year 40. Vol. 1. No. 13. pp. 172–178.

This paper consists of two parts. In the first is given a general description of yaws, noting in 500 cases the relative frequency of the different parts of the body as the site of the primary lesion. This was on the leg or foot in nearly 70 per cent. In the second part the authors give brief notes of ten patients treated by treparsol. Stovarsol and treparsol by mouth they found very efficacious, but the latter preferable as being more easily absorbed and more regularly eliminated. They gave the drug on three successive days, three tablets (comprimidos) daily; this course was repeated three times with intervals of five days as a rule, and excellent results were obtained. [Unfortunately, the quantity in a dose is not stated.]

H. Harold Scott.

BANDYOPADHYAY (B. N.). **Congenital Yaws.**—*Indian Med. Gaz.* 1926. Mar. Vol. 61. No. 3. pp. 120–121.

At the Native Civil Hospital, Kisumu, Kenya Colony, a large number of cases of yaws came under observation, including a certain number of very young infants. The case now cited is published as one of congenital yaws, by which one gathers from the context Sub-Assistant Surgeon Bandyopadhyay means a case infected before birth. A baby two weeks old was brought up for treatment of yaws, and the following history is given: the mother was treated by the author for yaws six months previously; the father is stated to have had syphilis six years before and to have been treated with N.A.B. Two children born to another wife were both healthy, the third of his children being the babe under consideration born of his second wife.

[No clinical account of the manifestations in the child and no dates in the family history are given. There appears to be no evidence from the published account that the case was one of congenital yaws.]

H. S. S.

DEVOTA (T. J.). **Two Uncommon Cases of Yaws.**—*Malayan Med. Jl.* Singapore. 1926. May. Vol. 1. No. 2. p. 28.

Malay boys, aged 3–4 years (two cases), are recorded as suffering from retention of urine in consequence of cicatricial phimosis following yaws. Hospital-assistant Devota states that these were the only cases of such a condition seen among 12,000 cases of yaws, 3,000 of whom were children under 12 years of age, treated in Kelantan. In the first case a large collection of pultaceous phosphatic deposit was found in the preputial sac; in the second several hundred small phosphatic calculi.

H. S. S.

BITTNER (L. H.). **Some Observations on the Tertiary Lesions of Framboesia Tropica, or Yaws.**—*Amer. Jl. Trop. Med.* 1926. Mar. Vol. 6. No. 2. pp. 123–130. With 4 text figs. [9 refs.]

Account is given of two cases of rhinopharyngitis mutilans and four of keratoma plantare sulcatum met with in Java, and mention is made of juxta-articular nodules, the author joining with those who believe these conditions to be yaws manifestations.

H. S. S.

ZIEMANN (Hans). Beitrag zur Frage der "sogenannten Rhinopharyngitis mutilans". [**The So-called Rhinopharyngitis mutilans.**]—*Ibid.* pp. 161–182. With 18 text figs. [73 refs.]

Ziemann deals with 13 cases of gangosa observed in Kameroon, obviously a good many years ago, as he says it was before the introduction of salvarsan. In none of these were there other bony changes in the skeleton comparable to those seen in syphilis. In none of those in which it was possible to make microscopical and histological examinations were parasites found save in one in which some bodies were seen resembling blastomycetes. In two cases in which the Wassermann reaction was performed the result was fully positive. The author is inclined to believe that the condition is a late manifestation of yaws in spite of the negative findings and in spite of the fact that his cases gave no history of previous yaws. Seven pages are devoted to an historical survey of the subject and quite an extensive bibliography is given.

H. S. S.

PINEDA (Eloy V.) & WADE (H. W.). **The Public Health Value of the Kahn Precipitation Test with Special Reference to Yaws.**—*Jl. Philippine Islands Med. Assoc.* 1926. June. Vol. 6. No. 6. pp. 183–187. [5 refs.]

After discussing the relative value of the Kahn and the Wassermann test the authors conclude that in the former they have a very valuable means of diagnosis of spirochaetal infections. In 575 sera parallel tests gave an average agreement of 89·4 per cent. In latent yaws they found the Kahn test more sensitive. The tests were used in the diagnosis of syphilis and yaws among the leper population of Culion Colony where 4 per cent. and 10 per cent. respectively are affected with these two diseases. The authors point out (as has been pointed out before in

these columns the necessity of carrying out a long series of observations on the results of treatment as given in anti-yaws campaigns expressed in terms of serum reactions, and they think the Kahn test the most suitable to be so employed.

H. S. S.

IKEGAMI (Y.). **An Experimental Study on Framboesia.**—*Japan Jl. Dermat. & Urol.* 1926. May, June. Vol. 26. No. 5, 6. English summary pp. 36–37. [In Japanese pp. 508–510.]

An experimental study on the lines of the researches made by BROWN and PEARCE in America. Inoculation of rabbits into scrotal skin, into testicle and anterior chamber of eye was practised. 80–90 per cent. of the skin and testicle cases were successfully infected with incubation period of a month, a higher infection rate and shorter incubation period being noted in winter than in summer. Among 16 infected by scrotal skin route, 4 gave positive W.R. but all negative Sachs-Georgi reaction. Among the intratesticular cases W.R. was positive in 64 per cent. and Sachs-Georgi in 42 per cent.

H. S. S.

SCHLOSSBERGER (H.) & PRIGGE (R.). Beobachtungen bei der Recurrensinfektion syphilis- und frambösiekranker Kaninchen. [**Infection with Relapsing Fever of Rabbits previously infected with Yaws and Syphilis.**]—*Med. Klin.* 1926. Aug. 6. Vol. 22. No. 32 (1130). pp. 1227–1229. With 1 text fig. [3 refs.]

In view of the recent developments in treatment of general paralysis by inoculated relapsing fever the authors conducted a series of experiments to determine the results of intravenous injection of the blood of mice infected with *Sp. recurrentis* into rabbits already infected with syphilis or yaws. Their conclusions are as follows: Inoculation of large quantities of blood as above succeeds in many cases in infecting the syphilitic or framboesial rabbit, but the *Sp. recurrentis* is only found in small numbers and for a very short period in the blood. At the same time the spirochaetes of syphilis or yaws are found for many weeks in their respective lesions. The spirochaete of relapsing fever appears to exert no antagonistic action upon those of syphilis or yaws. On the contrary, there appeared to be a marked persistence of the syphilitic or framboesial sore in these secondarily inoculated cases. In the treatment of syphilis in man and more especially of G.P.I. inoculation with relapsing fever must be regarded as a non-specific therapy. Attention is called to the possibility that the spirochaetes of relapsing fever settle in the meninges and cause them to be more permeable to the passage of chemical therapeutical agents.

H. S. S.

BOISSEAU (R.). Traitement du pian par l'acétylarsan: avantages de ce produit chez l'enfant. [**Treatment of Yaws by Acetylarsan: its Advantages in Children.**]—*Bull. Soc. Path. Exot.* 1926. June 9. Vol. 19. No. 6. pp. 416–419. [12 refs.]

The author calls attention to the advantages possessed by this drug —diethylamine oxyacetylaminophenylarsinate; it is made up in solution in water, contained in ampoules of two strengths suitable for

adults and children respectively; it is colourless, keeps indefinitely, is rich in arsenic, but being easily eliminated may be given in big doses subcutaneously without pain at 48-hour interval (2 cgm. per kilo of wt.). The results are equal to those obtained by other preparations.

H. S. S.

FRANKLIN (J. C.). **Treatment of Yaws by Novarsenobillon.** [Memoranda.]—*Brit. Med. Jl.* 1926. June 5. p. 943.

Reports from Nigeria a case of yaws with large ganglia on the back of the hand; the ganglia as well as the eruption disappeared under treatment with N.A.B. The author has also used this treatment with success in cases with contracted tendons and in a case with ganglia but with no yaws. It is not stated whether the last mentioned cases had a history of past yaws: one may surmise that they had, but the author appears unaware of the framboesial affections of tendon-sheaths described by other writers.]

H. S. S.

SHIRCORE (J. O.). **Yaws and Syphilis in Tropical Africa: Mass Treatment with Bismuth-Arsenic Compounds.** [Correspondence.]—*Lancet.* 1926. July 3. pp. 43–44.

The use of a compound produced by the interaction of bismuth sodium tartrate ("Sobita," Howard & Sons) and soamin in the treatment of yaws and syphilis among natives of Tanganyika Territory is here reported. Dr. Shircore says that it had occurred to him that a mixture of these two drugs might produce a better therapeutic effect than the bismuth salt alone, but that he had not realized that a reaction might take place between these substances till after reading LEVADITI's work on "bistovol." He found that on boiling together solutions of soamin and bis. sod. tart. a precipitate is formed. "An hypodermic injection administered to myself of the whole preparation produced by 3 gr. each of bismuth and soamin in 2 ccm. of water" was followed by no untoward result. This experiment was followed by the use of this preparation for the treatment of natives suffering from yaws and syphilis and good results are reported. Dr. Shircore hopes that others "who have the welfare of the native at heart . . . . may give it a trial." [A word of warning would appear justified in this connexion even though the results obtained may appear to justify the means adopted. The injection into the body of substances of unknown composition and without previous control experiments can hardly be considered a wise proceeding. Sobita is specially prepared as neutral as possible and any admixture with another substance such as soamin would certainly result in decomposition. As a matter of fact this interaction does result in the formation of a precipitate (due to combination or breakdown of both molecules) which contains both bismuth and arsenic but the composition is uncertain. Research on this matter may yield interesting results.

H. S. S.

WINCKEL (Ch. W. F.). Die Bekämpfung der Framboesia tropica. [**The Campaign against Yaws.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Vol. 30. No. 1. pp. 184–192.

Winckel deals in general terms with the anti-yaws campaign being carried out in Java, where in certain areas 90 per cent. of the population is affected.

He accepts pseudo-lepra, gangosa, juxta-articular nodules and goundou as manifestations of yaws and believes that many if not all the cases diagnosed and treated as syphilis at the same time were cases of yaws. Cases were treated by a single injection of ·45 gm. neosalvarsan [the author being ignorant of the good results obtained elsewhere with bismuth salts]. Except the immediate good results obtained in many, the true results were unknown since the patients were not again seen. [No clinical information and no statistics.]

H. S. S.

i. WINCKEL (Ch. W. F.). Bekämpfung der Framboësia tropica mit Salvarsan. [**Treatment of Yaws by Salvarsan.**]—*Dermat. Woch.* 1926. June 26. Vol. 82. No. 26. pp. 874–878. With 1 fig.

ii. DELBANCO (Ernst). Zum Aufsatz von WINCKEL: Bekämpfung der Framboësia tropica mit Salvarsan. Ein Ausblick auf die Bekämpfung der Syphilis.—*Ibid.* pp. 878–879.

i. Some general observations on the use of salvarsan in the anti-yaws campaign in the Dutch East Indies where, by the end of 1924, some 1,600,000 injections had been given. [The paper, however, contains nothing that has not already appeared in previous communications by this author, who maintains that salvarsan is the best drug for the purpose, leaving out the question of cost, in D.E.I. payment since made by the natives covered the cost of treatment.]

ii. Some general observations on the treatment of syphilis by salvarsan in view of the results obtained in yaws in the Dutch E. Indies.

H. S. S.

VAN HOOF (L.). A propos des nodosités juxta-articulaires. [**Juxta-Articular Nodules.**]—*Ann. Soc. Belge de Méd. Trop.* 1926. Apr. Vol. 6. No. 1. pp. 53–56. With 7 figs. on 4 plates. [2 refs.]

Replying to a demand made in the *Bruxelles Médical* for further observations on this subject by workers in the tropics, Van Hoof states definitely that he is led to believe that J.A.N. are of framboesial origin, to the exclusion of syphilis, filariasis and the mycoses. He finds that the swellings due to onchocerca tend to occur in the same sites as J.A.N., and while they cannot be differentiated on simple clinical examination, puncture of the cyst and examination of the sero-purulent contents always reveals embryos, thus establishing the diagnosis. The histological picture varies in the two cases also—J.A.N. do not show giant cells, Wolff's fibres or newly formed capillaries. Further attempts to cultivate any fungus from aspirated fluid have failed. On the other hand, in this fluid may often be demonstrated spirochaetes of the pallida-pertenue type. His observations were made in Mayombe—Congo Belge—where nearly the whole population shows some manifestation of yaws and where only a single, imported, case of syphilis was encountered. Some cases showing J.A.N. also presented joint troubles

resembling secondary syphilitic synovitis affecting wrists and instep. These cleared up under treatment by N.A.B. and the nodes showed marked retrogression though the process is slow and seldom complete.

H. S. S.

PERDOMO HURTADO (B.) & FERRER VIERA (Miguel). Nota preliminar sobre un caso de "Nudosidades juxta-articulares de Lutz y Jeanselme". [**Note on a Case of Juxta-articular Nodules.**]—*Rev. Med. y Cirug.* Caracas. 1926. May. Vol. 9. No. 98. pp. 75–79.

An account of a patient, 50 years of age, exhibiting a dozen or so small nodules in the neighbourhood of the elbows, wrists, knees and ankles. Some were subcutaneous and moveable, others appeared adherent to the periosteum. The remainder of the paper consists of extracts from the earlier description of juxta-articular nodules by LUTZ and JEANSELME. This patient's serum gave a positive Wassermann reaction.

H. Harold Scott.

MCNAUGHTON (J. G.). **A Case of Goundou.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1926. Mar. 18 & May 20. Vol. 20. Nos. 1 & 2. p. 123.

A short note recording the case of a native female child aged 10 years observed in Dar-es-Salaam, Tanganyika Territory, suffering from goundou. The paranasal swellings were the size of sparrows' eggs, symmetrical and of bony hardness. There was a history of yaws 24 months before being seen which cleared up untreated; the swellings appeared six months later. The condition was associated with "sabre-shaped tibiae" and marked anaemia but no other signs referable to yaws or syphilis. Two injections at a week's interval of bis. sod. tart. gr.3 and soamin gr.2 caused no change in the condition.

[This case should be compared with those cited by BOTREAU-ROUSSEL in his monograph, this *Bulletin* Vol. 22, p. 421, and it would be interesting if all such cases (goundou) were put on record with a view to settling the etiology of the condition.]

H. S. S.

HANSCHELL (H. M.). **On the Influence of Race in Venereal Disease.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1925. Nov. 19 & Dec. 17. Vol. 19. Nos. 5 & 6. pp. 321–327.

Working with clinical material available at the V.D. Clinic, Seamen's Hospital, Royal Albert Dock, during six years the author has attempted to ascertain whether the three venereal diseases, ulcus molle, gonorrhoea and syphilis, manifested any differences according to the race of the patient.

1. *Ulcus molle*: 12 Chinese, 20 Negroes, 30 Indians, 55 North-Europeans. No clinical differences in members of the several races were observed, nor among the Europeans, whatever the race of the source of infection.

2. *Gonorrhoea*: 60 Chinese, 65 Negroes, 92 Indians, 600 North-Europeans. Among the non-Europeans in a great majority of cases the disease was more severe than among the Europeans, due only to neglect among the former. Except endocarditis and conjunctivitis of

gonorrhoeal origin which were not seen, every type of disease and every kind of complication was met with among all groups. Among the Europeans infected by non-European women the disease showed no difference from the disease contracted from Europeans.

3. *Syphilis:* 72 Chinese, 75 Negroes, 105 Indians, 700 North-Europeans. With primary and secondary syphilis which form the majority of cases in each group, no differences, except those that may be fairly classed as individual and not racial, were detected clinically or serologically. Similar variations occurred in each group. Microscopical examinations of spironemes from the several groups appeared to show no differences and the response to treatment was similar in all groups. Among the tertiary cases the numbers for the non-Europeans are too small to be of much value, but each group contained "cases of skin, bone, cardiac and vascular lesions, and hemiplegias." No case of syphilis of the central nervous system (parenchymatous neuro-syphilis) came under the author's observation at the clinic in the first instance; a few cases were passed on to him from other departments. They included among North-Europeans six cases of tabes and three of G.P.I.; one Chinaman and two Negroes with tabes; one Indian with G.P.I. The author says: "For what it is worth this experience suggests that syphilis of the central nervous system is definitely commoner in the three non-European groups than in the European." A point of special interest is that one European with G.P.I. and two with tabes had acquired their infection from a Chinese, an Indian and a Negro woman respectively. In his conclusions the author "suspects that reported differences in the several venereal diseases in different racial groups are founded mainly on locally conditioned circumstances affecting the investigation of these cases."

[It is interesting to compare these observations upon natives living what may be termed unnatural lives with the findings of other observers working among native communities in their own countries wherein it is an accepted fact that tabes and G.P.I. are very rare as compared with Europeans. There is a good deal of valuable evidence, too, that the various manifestations of syphilis do differ in their incidence among the several races and that such differences do depend upon racial, anatomical and physiological differences.]

H. S. S.

Olmer (D.). La syphilis hépatique tertiaire de l'adulte. (Diagnostic. Indications et résultats du traitement spécifique). [**Tertiary Syphilis of the Liver in the Adult.**]—*Rev. Prat. Malad. des Pays Chauds.* 1926. Feb. Year 4. Vol. 5. No. 10. pp. 446–60.

The author draws attention to the frequency with which lesions of the liver have a syphilitic origin and to their polymorphism. They may be latent, that is to say without symptoms, in the form of isolated gummata or as an interstitial hepatitis causing hypertrophy, or these signs may be accompanied with clinical manifestations. Among the latter, he describes five types: (1) hypertrophic hepatitis with chronic jaundice; (2) Hanot's disease; (3) hypertrophic cirrhosis with splenomegaly and ascites of Ménétrier; (4) hypertrophic cirrhosis with splenomegaly, but without ascites or jaundice of Léon Blum; (5) hypertrophic cirrhosis with pigmentation, Olmer and Gros. Short descriptions are given of the clinical signs and the serum reactions in these cases, the important point for the tropical practitioner being the fact

that in some cases a persisting intermitting fever may be present, making a differential diagnosis from liver abscess very difficult. Treatment may give very satisfactory results, but in some cases which are undoubtedly syphilitic in origin specific treatment meets with no success. Great caution is essential in exhibiting these remedies, owing to the ease with which toxic symptoms may be induced. The author advocates potassium iodide in doses of ½ to 6 gm. *per diem* in gradually increasing doses, associated with intravenous injections of mercuric cyanide for 10 days, or intramuscular injections of bismuth. Organic arsenicals are considered too dangerous to use, except sulpharsenol in doses of 0·15 gm. once a week.

H. S. S.

MEHTA (Vallabhdas N.). **A Case of Syphilis of the Liver suggesting Liver Abscess.**—*Indian Med. Gaz.* 1926. May. Vol. 61. No. 5. p. 230.

Report of the case of a male aged 40 [nationality not stated] who, having suffered for three months from pain and tenderness over the liver, with fever, rigors and sweats and been treated by 12 injections, each of quinine and emetine, acknowledged a previous sore on the penis. Antisyphilitic treatment [nature of treatment not mentioned], resulted in disappearance of fever and pain by the fourth day, and convalescence in three weeks.

H. S. S.

RAYNAUD (M.), LACROIX (A.), BÉRAUD (M.) & BOUTIN (P.). Les modifications du liquide céphalo-rachidien au cours de la syphilis chez les Musulmans algériens. Premier mémoire. [**Changes in the C.S.F. in the Course of Syphilis in Algerian Musulmans.** —*Bull. Soc. Française Dermat. et Syph.* 1926. Feb. No. 2. pp. 139–144.

Observations were made upon: (*a*) 38 primary-secondary cases; (*b*) 24 tertiary cases, and (*c*) 6 of neurosyphilis, recording the following points: cerebrospinal fluid pressure, albumin content, cellular count, Wassermann reaction and colloidal benzoin curve together with a note as to reaction following lumbar puncture. These may be summarized in the following table:—

	(A) Per cent.	(B) Per cent.	(C) Per cent.
Tension above normal	36	37	83
Albumin content raised	21	8·3	50
Leucocyte count abnormal ...	26	41·6	50
Wassermann reaction positive ...	0%	0%	33
Benzoin reaction	—	—	50

Further observations will be published later.

H. S. S.

HILL (O. A. R. Berkeley). **A Note on the Incidence of Neuro-Syphilis among Coloured Races.**—*Indian Med. Gaz.* 1926. Feb. Vol. 61. No. 2. pp. 57–62.

In 1922, at the request of Professor KRAEPELIN, a questionnaire on the subject, drawn up by Major Hill, was issued to all Army Divisional Headquarters and Medical Departments in each Province in India.

Copies were also sent to Egypt, South Africa, Nigeria, Gold Coast, Ceylon, Hong Kong, F. M. States, Japan, Madagascar, Belgian Congo and U.S.A. Summaries, in a few lines, of the replies received from 32 stations in India, form the body of this article, together with some notes from Ceylon, Nigeria, F. M. S., a table of deaths from G.P.I. and tabes in U.S.A. and some quotations from an article by WENDER on G.P.I. in Panama.

No general summary is given, and from the nature of the material it is impossible, even in the case of India, to formulate any conclusions. The general impression given is that G.P.I., and still more perhaps tabes, is rare among native races, an opinion which has been held for many years. It is, however, always uncertain whether cases of any particular disease in native countries come under observation, and even if they do, whether they are recognized. WENDER states of the Panama coloured people, that the idea of immunity to G.P.I. has been disproved, and that the fallacy depended on lack of appreciation of the proper symptoms of that disease in coloured races. Practically all reporters only refer to G.P.I. and tabes, and ignore other manifestations of neurosyphilis.]

H. S. S.

MOTAIS (F.). Le tabès en Cochinchine. [**Tabes in Cochin-China.**]—*Bull. Soc. Path. Exot.* 1926. Feb. 10. Vol. 19. No. 2. pp. 81–86.

It has been hitherto believed that tabes is a very infrequent manifestation of syphilis in Cochin-China. MONTEL noted two cases in 23 years' practice and among 150,000 patients; general paralysis he had never seen. The author has an ophthalmological clinic, and his experience since 1923 leads him to believe that syphilitic eye symptoms are the same with few exceptions in Cochin-Chinese as in Europeans. Of 28 patients with optic atrophy, seen as out-patients, many had other symptoms of degenerative nervous syphilis. Some details are given; loss of knee-jerks, Argyll-Robertson pupil, lightning pains, ataxia were among the symptoms. The author asks why he has discovered these cases when others have failed, and replies that it is because the Annamites learned that at the ophthalmological clinic sight was restored to the blind. None of the tabetics complained of anything but blindness, and the natives in any case do not consult a European doctor for insidious and chronic complaints such as tabes. In France, the proportion of tabetics with optic atrophy lies between 15 and 30 per cent.; there are probably then many tabetics in Cochin-China.

The author remarks that ataxia is much less evident here than in Europe because the feet are bare; in keeping contact with the ground with the bare sole they can more easily correct the tendency to disordered movement.

A. G. B.

MULDER (Denis). Prophylaxis der Dementia Paralytica. [**Prophylaxis of General Paralysis.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1926. Vol. 66. No. 2. pp. 220–235. [5 refs.]

The author quotes the case of a Eurasian who acquired syphilis as a youngster. Though treated vigorously 25 years later the infection was not extinct. At this time the patient suffered from well-marked

symptoms of G.P.I. He was inoculated with tertian malaria, which rendered him very ill but disappeared spontaneously after 14 attacks. By that time the psychical condition had returned to normal, though the cerebrospinal fluid still showed all the characteristics of syphilis and the blood contained numerous malarial parasites. Mulder thinks that the presence of spirochaetes is of minor importance in the causation of G.P.I. In natives of the Dutch East Indies this affection is very rare, owing, according to the author, to the fact that regular treatment is rarely administered in this people, and accordingly natural immunization is not interfered with. Immunization protects, sterilization weakens the natural powers of protection.

Mulder regards the introduction of chemical drugs as one of the menaces civilization has brought to the native. [See MULDER, *ante* p. 452].

W. J. Bais.

PLAUT (F.) & JAHNEL (F.). Die progressive Paralyse—eine Folge der Schutzpockenimpfung? [**Is G.P.I. a Sequel of Anti-Smallpox Vaccination?**]—*Muench. Med. Woch.* 1926. Mar. 5. Vol. 73. No. 10. pp. 396—400. [25 refs.]

The authors review some of the literature dealing with the thesis that G.P.I. is a result of vaccination with calf lymph, and those interested in this subject should consult the original paper and the bibliography given. Most of the evidence is uncertain and much of it more than inconclusive, but the speculation is interesting and may help to throw light on the difficult problem of the incidence of general paralysis.

H. S. S.

ADELMANN (Edgar G.). Beitrag zur Behandlung des Ulcus molle an Bord. [**Treatment of Soft Sore on Board Ship.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. July 1. Vol. 30. No. 7. pp. 297–298.

A short note to record the good healing effect, obtained in five cases, of the direct action of sunlight focussed through a burning-glass on the edges of the lesions, as experimentally observed on board ship along the South American coast. This procedure is suggested for further trial as a method of choice or as a supplementary measure.

W. Jenkins Oliver.

EWSTIFÉIEFF. Traitement du chancre mou et du bubon par les attouchements à l'acide phénique pur, chez les indigènes du Sénégal. [**Treatment of Soft Chancre and Inguinal Bubo among Natives of Senegal by Pure Carbolic Acid.**]—*Bull. Soc. Path. Exot.* 1926. Apr. 14. Vol. 19. No. 4. pp. 314–315.

Basing his opinion on three cases the author is of opinion that the treatment advocated is superior to any other. It consists in the application of pure carbolic acid to the chancroid and to any inguinal bubo which has ulcerated, followed by a dressing of iodoform powder.

H. S. S.

i. CALLANAN (J. C. J.). **Some Observations on Framboesia Tropica, made in a District of Kikuyu Province, Kenya Colony.**—*Kenya Med. Jl.* 1926. June. Vol. 3. No. 3. pp. 62–88. With 4 plates.

ii. SURTI (S. B.). **The Treatment of Syphilis by Benzo-Bismuth.**—*Indian Med. Gaz.* 1926. May. Vol. 61. No. 5. pp. 214–215.

iii. GEORG (Carl Theodor). Kurze klinische Mitteilungen aus dem Hospital San Antonio (C. Th. Georg), San Pedro de Macoris (Santo Domingo). **Clinical Notes from Santo Domingo.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Jan. 8. Vol. 30. No. 1. pp. 30–32. With 2 text figs.

i. This paper, which was originally printed as a thesis and appeared in condensed form in the *Transactions of the Royal Society of Tropical Medicine and Hygiene*, has been already noticed in this *Bulletin, ante*, p. 446.

ii. After giving this preparation what the author calls "a fair trial" [a single short course in each of four cases] he reports highly of its curative properties.

H. S. S.

iii. One case of syphilis or yaws and one of yaws, with photographs.

A. G. B.

CLIMATIC BUBO.

HANSCHELL (H. M.) **Observations on Climatic Bubo.**—*Lancet.* 1926. Aug. 7. pp. 276–277.

Some notes upon cases seen in Africa, in the West Indies, and 26 cases at the Seamen's Hospital, London. Reference is made to the occurrence in two cases 3–4 weeks after infecting coitus of shallow pin-head ulcers in the post-coronal sulcus, lesions which have been described by others. No case was seen in a circumcised man. One case contracted the disease in Marseilles, one denied coitus, and another had never been out of England. Fever was commonly noted. No organism was found in aspirated juices nor in sections of excised glands. The author found the morbid changes could not be constantly differentiated from the changes found in inflamed glands associated with ulcus molle or scabies. The treatment adopted consisted in swabbing the glans, etc., with methylated spirit (90 per cent.), a single such application sufficing to clear up the balanitis: cleaning up, trimming of open lesions and applications of eusol: aspiration of fluctuating glands, never incision. T.A.B. vaccine, 100 millions intravenously, was then given with invariable good result and rapid involution of the disease; only rarely was it necessary to give a second injection (in 4–5 days of 150–200 millions), and more rarely still a third.

[The author informs the reviewer that the number was 26.]

H. S. Stannus.

LOW (George C.) & COOKE (W. E.) **Climatic Bubo and its Treatment by "Protein Shock" and Aspiration.**—*Jl. State Med.* 1926. Aug. Vol. 34. No. 8. pp. 450–463.

The authors after giving a short résumé of our knowledge of this affection record notes of four cases treated by the method advocated by HANSCHELL and referred to above—aspiration, eusol and T.A.B. vaccine intravenously in doses of 50 or 100, 200 and 250 millions at six-day intervals, as required, with excellent results in each case.

H. S. S.

DE BELLARD (E. P.). **Subacute Inguinal Poradenitis, or Climatic Bubo.**—*Jl. Trop. Med. & Hyg.* 1926. Apr. 1. Vol. 29. No. 7. pp. 103–108. [27 refs.]

Based on the study of 22 cases in Venezuela during four years, the author gives a very good account of the condition known as climatic bubo, for which, however, he proposes the term that appears at the head of this paper as "less cumbersome than others and as fairly well descriptive of the disease." [It is less cumbersome than some that have been proposed, but until such time as the etiology of this disease be settled the rather non committal old name has much in its favour.] The clinical account and descriptions of the pathological findings are clear and do not differ materially from those recently given by other authors. Full reports of the cases, pathological and experimental work are given in the author's Monograph presented to the Fourth Venezuela Congress of Medicine, Caracas, 1925. [*ante*, p. 490].

Animal inoculation with gland emulsions in saline was partially successful; in two monkeys the clinical and pathological pictures of climatic bubo were reproduced, results resembling those obtained by VIRGILLO [this *Bulletin*, Vol. 22, p. 988]. The author advises surgical extirpation, as in his experience all other forms of treatment "yield uncertain and unsatisfactory results"; [but he does not appear to have tried tartar emetic on the one hand nor on the other protein shock therapy].

H. S. S.

HASHIMOTO (T.). Ueber eine besondere Art von Bubonen (sogenannten klimatischen Bubonen). [**A Peculiar Kind of Bubo (so-called Climatic Bubo).**—*Japan Jl. Dermat. & Urol.* 1926. Mar. Vol. 26. No. 3. German summary p. 5. [In Japanese pp. 179–196. 12 refs.]

Cases of climatic bubo were seen in Manchuria, generally among young adults. In four cases the W.R. was positive and three had poor constitutions, but in none of these was there any history nor clinical manifestation of syphilis or tuberculosis. Sections of glands after removal showed no evidence of either of these diseases. Inoculation of animals with gland tissue and juice, cultural and smear preparations were negative except that in one case a streptococcus and in another *Staphylococcus aureus* was found.

H. S. S.

PARDO-CASTELLO (V.). **Lymphogranulomatosis Inguinalis.**—*Arch. Dermat. & Syph.* 1926. July. Vol. 14. No. 1. pp. 35–43. With 1 text fig. [18 refs.]

After giving references to earlier writers, a useful list, some account of the clinical manifestations of the disease [climatic bubo] are given; the author describes three types of initial genital lesions. The incubation period is stated as 1–(3) 6 weeks. Mention is also made of the fact that the portal of entry of the virus may be the mouth and throat and the adenitis be in the cervical region, also that some generalized adenitis may be associated with the local enlargement of the groin. General symptoms may be severe: temperature over 105°, with mental stupor, delirium, dry tongue, anorexia and the picture of septicaemia with slight enlargement of liver and spleen *plus* albuminuria.

No specific organism has been found and inoculation experiments are negative. The treatment used in the author's own three cases was surgical. He makes a suggestion which may not be known to all but may be of considerable value, namely, that solutions of tartar emetic should never be sterilized by heat but by filtration through a Chamberland bougie.

H. S. S.

HOME (W. E.). **Climatic Bubo.**—*Jl. Roy. Nav. Med. Serv.* 1926. July. Vol. 12. No. 3. pp. 210–212.

Some general recollections of cases seen in the Navy in the past with a table showing incidence per thousand men in 10-year periods from 1862 on the various naval stations.

H. S. S.

GRANULOMA VENEREUM.

GOLDZIEHER (M.) & PECK (S. M.). Das venerische Granulom. [**Granuloma venereum.**—*Virchows Arch. f. Path. Anat. u. Physiol.* 1926. Mar. 3. Vol. 259. No. 3. pp. 795–814. With 9 text figs. [67 refs.]

After summarizing the work of other writers on this subject Professor Goldzieher and his colleague refer to their own seven cases—two women and five men, all coloured—observed in New York. The disease had existed from 3 months to 26 years in the several cases. In the first-mentioned the evolution of the condition after an incubation period of three weeks is described. Detailed descriptions of the histopathological conditions are then given, including the morphology of an organism which the authors believe to be the causative organism of the disease. This pleomorphic cocco-bacillus they were able to cultivate, most easily on Sabouraud's maltose agar medium, and the cultural characteristics are set down in full. Further, they were able to infect rabbits, in one case with the production of a granuloma. Lastly, positive results obtained by agglutination and complement deviation tests are claimed. This paper is too long to summarize more fully but will doubtless be read by all those interested in the problem of this disease.

H. S. Stannus.

GOLDZIEHER (Max) & PECK (Samuel M.). **Granuloma Inguinale: Clinical Observations, Vaccine Treatment and Allergic Reactions.**—*Arch. Dermat. & Syph.* 1926. July. Vol. 14. No. 1. pp. 14–27. With 7 text figs. [25 refs.]

After a short history of what is known of this affection and a useful list of references, the authors give their clinical observations on seven cases under care in New York City Hospital. Incubation period was believed to be about three weeks: the clinical picture is characteristic; there is a typical odour. A specific organism, a cocco-bacillus to be called *B. venereogranulomatis*, is found in large swollen mononuclear cells, themselves a characteristic feature in the histopathology. Analogous lesions were obtained in inoculated rabbits and positive

results given in three out of four complement fixation tests. Allergic skin reactions were also noted. The treatment advocated is by means of tartar emetic and a vaccine of the specific organism.

H. S. S.

THIERFELDER (M. N.) & THIERFELDER-THILLOT (M.). Die Behandlung des venerischen Granuloms. [**Treatment of Granuloma venereum.**] —*Muench. Med. Woch.* 1926. Apr. 2. Vol. 73. No. 14. pp. 561–563. [1 ref.]

During a period of three years 5,000 cases were treated in New Guinea; Professor Thierfelder therefore speaks with some authority. Routine treatment consisted in the administration by intravenous injection of 10–12 cc. of a 1 per cent. solution of tartar emetic every second day, 20–25 injections in all constituting a full course. The dose should not exceed ·10 to ·12 gm.; with ·15 muscular cramps and collapse may ensue, whereas with the smaller doses some cough or vomiting only may sometimes be produced. Stronger solutions may cause thrombosis and possess no advantages over the 1 per cent. strength. Again injection every second day or thrice per week was found to be the most efficient form of treatment; daily injections cause cachexia, and if given at long intervals the effect of the drug is lost; too small doses over a very long period cause paralysis. For women and children smaller doses according to weight are recommended; children tolerate antimony better than adults. Other methods of administration are impossible—by mouth the drug causes vomiting, intramuscular or subcutaneous injection causes necrosis, and local application to the lesion sets up intense pain. In early cases 10 injections may be followed by healing but relapse may occur. Cure usually results in such cases after 20 treatments. In rather later stages with larger areas involved some 11 per cent. relapse even after 20 injections, while in later cases still this number of injections is seldom sufficient to effect healing, and in these relapse is certainly to be expected. Second, third, and sometimes fourth courses have been given with two weeks' interval between the courses, but in many a second course is ill supported and third and fourth courses are followed by asthenia and cachexia, the antimony salt appearing to lose effect on the lesion as a result of the inability of the body to react to the drug. Under these conditions it is obvious that some alternative treatment is necessary, and the author tried out a number of other preparations with this object in view. Neosalvarsan and Bayer 205 were found to be useless. Stibenyl Heyden while of little value comparatively alone, was found useful to replace the second course of tartar emetic. Other preparations essayed were Heyden 661, Heyden 471, and Bayer Sb. 211. These appear to be well supported and some results are promising, but it is too early to speak more definitely of their use in the treatment of this condition.

H. S. S.

PURCELL (H. M.). **Granuloma Inguinale.**—*Southwestern Med.* 1926. July. Vol. 10. No. 7. pp. 309–310. [2 refs.]

Records a case in a negro of Arizona in whom the intravenous injection of tartar emetic (·04 to ·1 gm. daily) yielded poor results as compared with the immediate effects obtained by local applications to the lesion of ½ per cent. solution of the same salt on gauze.

H. S. S.

REVIEWS AND NOTICES.

MOODIE (Roy L.). [Ph.D., Associate Professor of Anatomy in the University of Illinois. **Paleopathology. An Introduction to the Study of Ancient Evidences of Disease.**—567 pp. With frontispiece, 49 figs. & 117 plates. 1923. University of Illinois Press, Urbana, Illinois.

This bulky tome forms practically an illustrated catalogue of all those specimens of fossil animals and ancient man which present evidence of injury or pathological changes, with some references to plant pathology. Such evidence is in the nature of things restricted, and it is obvious that while positive evidence may not yield much, little of value can be argued from the negative side. While there is evidence of bacterial and fungus activity among plants since the Devonian, bacterial infections among members of the animal kingdom are unknown before the late Paleozoic period.

The first half of the book is devoted to general remarks, fractures and deforming arthritides, the latter common among Pleistocene mammals. A reptile from the Permian of Texas—Dimetrodon—shows a fracture of the radius, while a Dinosaur which probably weighed close on 40 tons exhibits a haemangioma of the caudal vertebrae. Spondylitis deformans is stated to have existed during the past 100 million years. We ought not to grumble to-day at a little muscular rheumatism. Caries was apparently rare in prehistoric animals, but there is some evidence of its occurrence and a three-toed horse of perhaps a million and a half years ago suffered from something very much resembling actinomycosis. Again, it is interesting to think that bacteria have been demonstrated in coprolites. What a noble ancestry has the *B. coli !*

Several species of tsetse fly occurred during the Oligocene, and it is interesting to speculate whether they may have harboured the precursor of *T. brucei* and thus caused a decimating plague among the ungulate population of a million years ago or more.

Coming to MAN himself, reference is made to the exostosis on the left femur of Pithecanthropus, to the signs of a fracture in the ulna of Neanderthal man, to the possibly pathological thickening of the Piltdown skull. Lastly, two chapters deal with the material from ancient Egypt made known to us by FOUQUET, RUFFER and ELLIOT SMITH, and from Peru. Spondylitis deformans was common 3,000 years B.C., Pott's disease was found in a mummy of 1100 B.C., bilharziasis 1200 B.C., caries and pyorrhoea were not uncommon, and SHATTOCK demonstrated the presence of calcification of the aorta in the Pharaoh of the Hebrew exodus. Among the Precolumbian inhabitants of Peru osteitis was known and has been considered to be possibly of syphilitic origin. It seems just as likely that it was of framboesial origin in view of the fact that a skull of the same period shows the characteristic lesions of goundou.

Some of the well-known ancient Peruvian modelled water jars also bear witness to affections of tropical interest : one depicts the head of a man with goundou, another an achondroplasic dwarf with verruga peruviana, a third, South American leishmaniasis, and a fourth " Jiggers " of the soles of the feet.

H. S. Stannus.

a. Small water jar representation of an achondroplastic dwarf on whose body are seen the nodular eruptions of verruga. After ASHMEAD.

b. Evidence of goundou in ancient Peru.

c. These ancient Peruvian water jars show the seated figures examining the soles of their feet, in which there are holes left after taking out the egg sacs of the sand flea "nigua." Original in American Museum of Natural History.

d. An example of ancient Peruvian pottery showing an amputated leg, at the tibio-tarsal junction, with a cap of painted bone, or wood or metal, in the right hand of the figure to adjust to the stump of the leg. Collected at Chimbote, Peru, by Bandelier. Original in American Museum of Natural History.

[Reproduced from "Paleopathology" (Dr. Roy L. MOODIE).]

Errata.

Vol. 23. No. 3. p. 201. Foley & Meslin summary: 3rd line of title, for "Scientific Exploration of the *cases* of Gourara and Touat" read "*Oases.*"

Vol. 23. No. 10. p. 737, top line. Noguchi's summary. (Rocky Mountain Fever), for *Dermacentor rickettsia* read *Dermacentroxenus rickettsi*.

Vol. 23. No. 11. p. 854. Review of Grixoni (Geographical Medicine and Hygiene in Italian Colonial Possessions): last line of first para., for "anthropods" read "arthropods."

INDEX OF AUTHORS OR SOURCES.

The bracketed abbreviations after the page numbers indicate the subject.
Page numbers within brackets indicate papers not summarized.

Am. signifies Amoebiasis and Amoebic Dysentery.
Bb. ,, Beriberi.
Bl. ,, Blackwater.
B.R. ,, Book Review.
Chl. ,, Cholera.
C.Bu. ,, Climatic Bubo.
Der. ,, Tropical Dermatology.
Diet. ,, Native Dietaries.
Dys. ,, Dysentery (Bacillary and Unclassed).
Ent. ,, Enteric Fevers.
Fev. ,, Fevers.
G.V. ,, Granuloma Venereum.
Hel. ,, Helminthiasis.
H.S. ,, Heat Stroke.
Jaun. ,, Infectious Jaundice.
K.A. ,, Kala Azar.
Lab. ,, Laboratory Reports.
Lep. signifies Leprosy.
Mal. ,, Malaria.
Misc. ,, Miscellaneous.
Myc. ,, Tropical Mycology.
Oph. ,, Tropical Ophthalmology.
Pel. ,, Pellagra.
Pl. ,, Plague.
Rab. ,, Rabies.
R.F. ,, Relapsing Fever and Other Spirochaetoses.
Sc. ,, Scurvy.
Sp. ,, Sprue.
S.S. ,, Sleeping Sickness.
Tb. ,, Tuberculosis.
Und. ,, Undulant and Abortus Fever.
Y.F. ,, Yellow Fever.
Y. & S. ,, Yaws & Syphilis.
Z. ,, Medical Zoology.

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Brown, W. H., with Pearce, 19 (Y. & S.)
Brown, W. L., & Brown, C. P., 492 (Misc.)
Brug, S. L., 237 (B.R.), 366 (Am.)
Bruhl, I., & Ferru, M., 606 (Jaun.)
Brumpt, E., 35, 643, 644 (Am.), 134 (Mal.), 286, 287 (Z.)
Brun, G., with Burnet, 851 (Der.)
Bruni, N., (304) (Z.)
Brussin, A. M., 113 (R.F.)
Bruynoghe, R., & Dubois, A., 274 (Z.)
Buchmann, M., 648 (Am.)
Bucholz, C. H., 259 (Hel.)
Buckingham, E. W., 539 (Mal.)
de Buen, S., 533 (Mal.), 576 (K.A.), 590 *bis* (R.F.)
Bulletin de la Société de Pathologie Exotique, 899 (S.S.)
von Bülow, T., with Fallas, 16 (Y. & S.)
Bunker, H. A., (835) (Mal.)

Burgdorf, R., 42 (Dys.)
Burgess, A. S., 124 (Jaun.)
Burnet, E., 353, 731, 732 (Und.), 485 (Misc.)
——, & Brun, G., 851 (Der.)
——, & Masselot, F., 94 *bis* (K.A.)
——, ——, Calamida, F., & Ortona, C., 94 (K.A.)
Burnie, R. M., 33 (Am.)
Burnier, with Jeanselme, 588 (K.A.)
Buschke & Kroó, 119 (R.F.)
Businco, A., 159 (Lep.)
Busson, B., 196, 200 (Rab.)
Bykowa, O., 592 (R.F.)

C

Cabanis, with Gilbert & Tzanck, 515 (Lep.)
Cadbury, W. W., Jeu, L. N., & Harvey, J. L., 116 (R.F.)
Caius, J. F., Iyengar, K. R. K., & Anderson, L. A. P., 299 (Z.)
——, & Steichen, A., 299 (Z.)
Calalb, G., 42 (Dys.)
Calamida, F., with Burnet, Masselot & Ortona, 94 (K.A.)
Calcagno, O., 165 (Lep.)
Caldwell, E. L., with Caldwell, 775 (Hel.)
Caldwell, F. C., & Caldwell, E. L., 775 (Hel.)
Callanan, J. C., 446, 938 (Y. & S.)
Callender, G. R., 44 (Dys.), 156 (Lep.)
——, with Haughwout, 392 (Dys.)
——, Shepard, C. A., & Kirkwood, R. C., 319 (Tb.)
Calov, W. L., (71) (Bl.)
Cameron, T. W. M., 756 (Hel.)
Campanacci, D., 199 (Rab.)
Campos, E. de S., 62 (S.S.)
Campos, J. J., 108 (K.A.)
Canale, C., 358 *bis* (Und.)
Cannata, S., 578 (K.A.)
Cantacuzène, J., (191) (Chl.)
Capper, A., 227 (Misc.)
de Capua, F., 576 (K.A.)
Caputo, V., 158 (Lep.)
Carbo-Noboa, J. M., 736 (Fev.)
Cardosa, C. A., 768 (Hel.)
Carleton, H. M., 565 (B.R.)
Carmody, E. P., 71 (Bl.)
Caro, 140 (Mal.)
Carpenter, C. M., with Moore, 724 (Und.)
Carpenter, G. D. H., 63, 416 (S.S.)
——, with an Appendix by Poulton, E. B., 879 (Z.)
Carr, H. P., with Warren, 770 (Hel.)
Carrancá y Trujillo, R., 171 (Pel.)
Cassan, A., 352 (Und.)
Castellani, A., 214, 233, 476 (Misc.), 410 (Der.), 438, 440 (Myc.).
——, Douglas, M., & Thompson, E. T., 440 (Myc.)
——, & Taylor, F. E., 438 (Myc.)
Castex, M. R., & Galán, J. C., 704, 862 (Z.)
——, & Greenway, D., 641 (Am.)
——, & Lorenzo, R., 760 (Hel.)
de Castro, A. B., 563 (Mal.), 877 (Z.)
Castro, M., 778 (Hel.)
Catanei, A., (304), 702, (722) *bis*, (Z.), 525 (Mal.)
——, with Foley, Brouard & Demimuid, 133 (Mal.)
Catanei, A., with Foley, Brouard & Leblanc, 133 (Mal.)
——, with ——, Le Guillas & Brouard, 548 (Mal.)
——, with Sergent, Et., & Edm., 701 *bis* (Z.)
——, with ——, —— & ——, Parrot, & Foley, (564) (Mal.)
——, with Sergent, Et., 548 (Mal.)
——, with ——, Gueidon, Bouguet & Des Isles, 583 (K.A.)
Caudière, M., with Giraud, 577 (K.A.)
Causey, D., 588 (K.A.)
Cavalcanti, E. C., 523 (Lep.)
Cavassa, N. E., 297 (Z.)
Cavina-Pratesi, G., 122 (Fev.)
Cawston, F. G., 245, 246 *bis*, 746, 750 (Hel.), 303 *bis* (Z.)
Cayrel, A. M., 723 (Und.)
Céard, L., 313 (Tb.), 587 (K.A.)
——, with Baqué, Dekester, & Melnotte, 820 (Mal.)
Celli-Fraentzel, A., 560 (Mal.)
Césari, E., 104, 583 (K.A.)
Chagas, C., 913 (S.S.)
Chahovitch, X., 342 (Bb.)
Chalon, G., 404 (Der.)
——, with Alquier, (847) (Lep.)
Chand, D., with Sinton & Baily, 813 (Mal.)
Chand, H., 654 (Am.)
Chandler, A. C., 243, 265, 758, 759, 761, 767, 773, 774 *ter*, 775 (Hel.)
——, & Chopra, R. N., 243 (Hel.)
Chandler, A. G., 360 (Fev.)
Charrier, H., 134 (Mal.)
Chatellier, L., & Laurentier, C., (847) (Lep.)
Chatridse, I., & Kipschidse, N., 863 (Z.)
Chatterjee, A. C., 575, 578 (K.A.)
Chatterjee, K. N., (108), (K.A.), 541 (Mal.)
Chatterjee, R. B. G. C., 317 (Tb.)
Chatterjee, S., 834, (835), (Mal.)
Chau, K. T., & Wright, J. M., 211 (Misc.)
Chavarría, A. P., & Shipley, P. G., 409 (Der.)
Cheney, G., 766 (Hel.)
Chesterman, C. C., 58 (S.S.)
Chiang, S. F., 658 (Am.)
China Medical Journal, 519 (Lep.)
Chininum Scriptiones collectae, anno MCMXXIV editae, 565 (B.R.)
Chiray, M., & Lebon, J., 276 (Z.)
Chitre, G. D., with Fairley, Mackie, Gokhale, Gore, Malandkar & Sacasa, 795 (Sp.)
Chopra, R. N., 629 (Misc.)
——, & Bose, J. P., 218 (Misc.)
——, with Chandler, 243 (Hel.)
——, & Ghosh, S., 218 *bis* (Misc.)
Chopra, S. L., 541 (Mal.)
Cho Syu Cho, (191) (Chl.)
Choy, P. D., & Ludlow, A. I., 754 (Hel.)
Christophers, S. R., 264 (Hel.), 524 (Mal.), 573 (K.A.), (722) (Z.)
——, & Barraud, P. J., (722) (Z.)
——, with Greig, 97 (K.A.)
——, Shortt, H. E., & Barraud, P. J., 94, 95, 97, 103 *bis* (K.A.)
Christopherson, J. B., 246 (Hel.)
——, & Gloyne, S. R., 628 (Misc.)
Chu-Jen Ku, 916 (S.S.)
Chun, J. W. H., & Wu Lien Teh, 783 (Bb.)
Churchman, J. W., 477 (Misc.)
Ciuca, M., & Alexa, I., 549 (Mal.)

Ciuca, M., Irimesco, G., Manoliu, E., Alexa & Constantinesco, 546 (Mal.)
Clapier, 746 (Hel.)
Clark, H. C., 820 (Mal.), 879 (Z.), 889, 890 (Lab.)
Clearkin, P. A., with Shircore & Corson, 544 (Mal.)
Cleland, J. B., 213, 495 (Misc.), 443 (Myc.)
Clément, R., with Blum, 123 (Fev.)
Cochrane, R. G., 837 (Lep.)
Cochrane, T. S., & Allen, G. V., 552 (Mal.)
Coelho, G., with Bhatia, 224 (Misc.)
Coggeshall, L. T., 866 (Z.)
Coglievina, B., 140 (Mal.)
Colard, A., & Jaumain, D., 442 (Myc.)
——, with Jaumain, 441 (Myc.)
Colas-Belcour, J., 287 (Z.), 619 (Pl.)
——, & Lwoff, A., 701 (Z.)
— —, with Roubaud, 713 (Z.)
Collazo, J. A., & Funk, K., 342 (Bb.)
Collier, W. A., & Evers, E., 232 (Misc.)
Collin, L., & Schweisguth, 460 (Oph.)
Collins, R. K., 818 (Mal.)
Comptes Rendus du 5-ième Congrès anti-pesteux, Saratov, 617 (Pl.)
Concepcion, I., & Salcedo, Jr., J., 841 (Lep.)
Connal, A., 881 (Lab.)
——, & Smith, E. C., 382 (Dys.)
Constantinesco, with Ciuca, Irimesco, Manoliu & Alexa, 546 (Mal.)
Cooke, W. E., with Low, 938 (C.Bu.)
Coonoor, S. India Pasteur Inst., 198 (Rab.)
Cooper, A. T., 142 (Mal.)
Coppinger, C. J., with Perry, 40 (Dys.)
Cordes, W., 544, 824 (Mal.)
Corner, W., 132 (Mal.)
Cornwall, J. W., 198 (Rab.)
——, & Beer, W. A., 689 *bis*, 692 *bis* (Rab.)
Cornwall, L. H., & Peck, S. M., 455 (Y. & S.)
Corrado, E., 202 (Misc.)
Correia, F. da S., 253 (Hel.)
Corrigan, S. H., & Corrigan, C. E., 408 (Der.)
Corson, J. F., 254 (Hel.)
——, with Shircore & Clearkin, 544 (Mal.)
Cort, W. W., 271, 770 (Hel.)
——, Grant, J. B., & Stoll, N. R., 264 (Hel.)
Cortesi, T., (564) (Mal.)
——; Gérard; Salvo, 587 (K.A.)
Cosimi, B. V., (722) (Z.)
Cossio, R., with Mazza & Aybar Albarracin, 822 (Mal.)
Cousin, G., 871 (Z.)
Couto, M., 824 (Mal.)
Covell, G., 768 (Hel.)
Cowdry, E. V., (78) (Misc.), 296 (Z.)
Craig, C. F., 790 (B.R.)
Craighead, A. C., with Barraud & Shortt, 714 (Z.)
——, with Shortt & Barraud, 573 (K.A.)
Crawford, E. J., 616 (Pl.)
Cremonese, G., 144 (Mal.)
Créteur, (564) (Mal.)
Cross, H. E., 872 (Z.)
Cruickshank, M. M., 924 (Oph.)
Cruto, A., with Trocello, 76 (Misc.)
Cuboni, E., 710 (Z.)
Cuban Medical Board, 518 (Lep.)
da Cunha, P. A., (620) (Pl.)
Cunnigham, J., 112 (Bl.)
——, & Ramakrishnan, S., 73 (Misc.)
Curasson, G., 324 (Tb.)
Curtis, E. S., 601 (Fev.)
Cutler, M., 748 (Hel.)

D

Dargein, 727 (Und.)
— & Bellile, 352 (Und.)
Darling, S. T., 771 (Hel.), 813, 831 (Mal.)
Darquier, J., with Louste & Louet, 326 (Tb.)
Das, J., with Brahmachari, 579 (K.A.)
Das, S. K., 100 (K.A.)
Dattner, B., (152) (Mal.)
Daubney, R., 741 (Hel.)
Dautwiz, 383 (Dys.)
Davey, J. B., 419 (S.S.)
Davidson, T. W., 148 (Mal.)
Davis, A. E., 922 (Oph.)
Davis, N. C., 527 (Mal.), (880), 868 (Z.)
— —, & Boyd, M. F., 807 (Mal.)
Day, H. B., 229 (Misc.)
De, S. N., 870 (Z.)
Dear, W. R., 922 (Oph.)
Decrop, & Stier, 255 (Hel.)
Deeks, W. E., 65 (Bl.) 203 (Misc.), 831 (Mal.)
Defillo, F. A., 520 (Lep.)
Dekester, M., with Baqué, Céard & Melnotte, 820 (Mal.)
Delamare, G., 164, (847) (Lep.), 598 *bis* (R.F.)
—— & Achitouv, 125 (Jaun.), 406 (Der.) 684 (Pel.)
—— & Djémil, S., 552 (Mal.), 683 (Pel.)
Delanoë, G., 874 (Z.), 920 (Oph.)
Delanoë, P., 304 (Z.)
Delbanco, E., 403 (Der.), 932 (Y. & S.)
Delvoie, P., 764 (Hel.)
Demianov, G. S., 539 (Mal.)
Demianow, G. S., 538 (Mal.)
Demimuid, P., with Foley, Catanei & Brouard, 133 (Mal.)
Denney, O. E., 837 (Lep.)
——, Hopkins, R., Wooley, J. G., & Barentine, B. G., 162 (Lep.)
Desage, 752 (Hel.)
——, Pellerin & Vinerta, 726 (Und.)
Desangles, P., 313 (Tb.)
Deschiens, R., 278, 861 (Z.)
Des Isles, H. M., with Sergent, Et. Catanei, Gueidon, & Bouguet, 583 (K.A.)
Desnoes, P. H., 235 (Misc.)
Destéfano, F., & Vaccarezza, R. F., 227 (Misc.)
Deuskar, V. N., 647 (Am.)
Dévé, F., 757 (Hel.)
Devota, T. J., 929 (Y. & S.)
Devoto, A., 846 (Lep.)
Dew, H. R., 250, 756 (Hel.)
Dhairyam, J., 563 (Mal.)
Diacono, H., with Juillet, 294 (Z.)
Dickens, P. F., 397 (Dys.)
van Dijke, M. J., Bakker, C., & Hoesen, H. W., 21 (Y. & S.)
Dios, R. L., Zuccarini, I. A., & Oyarzabal, F., 426 (S.S.)
Diwan Chand, with Sinton, Rivas & Baily, 541 (Mal.)
Djémil, S., 787 (Sc.)
——, with Delamare, 552 (Mal.), 683 (Pel.)
Dobell, C., 702 (Z.)
—— & Laidlaw, P. P., 660 (Am.)

Dobreitzer, I. A., 138, 532 (Mal.)
Dobson, W. H., 815 (Mal.)
Docherty, J. F., 766, 767 (Hel.)
Dognon, A., 764 (Hel.)
Dohi, K., Takashashi, S., & Suzuki, S., 850 (Der.)
Dollfus, R. P., 744 (Hel.)
Domingo, P., 353 (Und.)
Donath, J. (400) (Dys.)
Donatien, A., with Sergent, Edm., & Parrot, 74 (Misc.)
van Dooren, T. P. C., 800 (Sp.)
Dore, S. E., 838 (Lep.)
Dostrowsky, A., 402 (Der.)
Douglas, B., 300 (Z.)
Douglas, M., with Castellani & Thompson, 440 (Myc.)
Dove, W. E., with Kirby-Smith & White, 781 (Hel.)
Drake-Brockman, R. E., 677 (Dys.)
Drbohlav, J. J., 34 *bis* (Am.), 102 (K.A.)
Dreyfus, G. L., & Hanau, R., 557 (Mal.)
Drummond, J., 171 (Pel.)
Dubois, A., (78) (Misc.)
— —, with Aublant, Lafenêtre & Lisbonne, 349 (Und.)
——, with Bruynoghe, 274 (Z.)
—— & Moncarey, 22 (Y. & S.)
Dubreuil, with Lancelin & Seguy, 732 (Und.)
Dubreuilh, W., 587 (K.A.)
Dudgeon, L. S., 577 (K.A.)
Duhamel, with Hudelo & Mouzon, 838 (Lep.)
Duke, L., 415 (S.S.)
Dukelsky, O., 427 (S.S.)
Dumas, J., Ramon, G., & Bilal, S., 39 (Dys.)
— , —— & Bilal, 672 (Dys.)
Duncan, J. T., 863 (Z.)
——, with Hindle, 293 (Z.)
Dundas, J. D., & Telang, D. M., 551 (Mal.)
Dunlap, A. M., 222 (Misc.)
Dunlop, N. J., 345 (Sc.)
Dunn, L. H., 868 (Z.)
—— , & Hanson, H., 612 (Y.F.)
— , with ——, 128 (Y.F.)
Dunne, J., 827 (Mal.)
Dupuy, 67 (Bl.), 151 (Mal.), 234 (Misc.)
Dupuy, L., 446 (Y. & S.), 747 (Hel.)
Durand, P., 474 (Misc.)
— , & Lumbroso, U., 919 (Oph.)
Dürck, H., 626 (Misc.)
Dye, W. H., 750 (Hel.), 894 (S.S.)
Dyer, H. A., with Voegtlin, 451 (Y. & S.)

E

Early, P. V., 27 (Y. & S.)
Eate, S. N., with Sinton, 822 (Mal.)
Ebert, B., & Hesse, E., 120 (Fev.)
Edwards, F. W., & James, S. P., 285 (Z.)
Edwards, J. T., 911 (S.S.)
Eguchi, C., (235) (Misc.)
Egyedi, H., 17 (Y. & S.)
Egypt, 926 (Oph.)
Eichhorn, with Soetomo, 18 (Y. & S.)
Einarsson, M., 755 (Hel.)
Eisler, M., & Kovács, N., 614 (Chl.)
Elders, C., 607 (Jaun.)
Ellery, R. S., 828 (Mal.)
Elton, C. S., 179 (Pl.)
Emile-Weil, P., & Stieffel, R. 435, 436 (Bl.)
Emily, J., 241 (Hel.)
v. Engel, R., 149, 540 (Mal.)
Engel-Bey, F., 793 (B.R.)
Epstein, H., & Rubinstein, B., 147 (Mal.)
Escartefigue, J., 839 (Lep.)
Escomel, E., 107 (K.A.), 275, 721 (Z.), 853 *bis* (Der.)
Esler, A. R., 19 (Y. & S.)
Espié, A., 252, 741 (Hel.)
Essed, W. F. R., 398 (Dys.), 809 *bis* (Mal.), 872 (Z.)
— —, with Rodenwaldt, 153 (B.R.)
Esser, A., 481 (Misc.)
Etchegoin, E., with Bezançon, 116, 597 (R.F.)
Evans, A. C., 357 (Und.)
Evans, A. M., (304 *bis*), 711 (Z.)
— , with Blacklock, 710 (Z.)
Evans, H. M., 301 (Z.)
Evans, T. C., 367 (Am.)
Evers, E., with Collier, 232 (Misc.)
Ewing, H. E., 873 (Z.)
Ewstifèieff, 937 (Y. & S.)
Eyraud, R., with Velu & Bigot, 698 (Rab.)
Eyre, J. W. H., (236) (Misc.)

F

Fabre, H., 244 (Hel.)
Facio, A. A., & Rojas, M. D., 70 (Bl.)
Fairbrother, T. H., Mason, F. A., Perkin, W. H., & Renshaw, A., 59 (S.S.)
Fairley, N. H., 247 (Hel.)
— — , & Mackie, F. P., assisted by Chitre, G. D., Gokhale, S. K., Gore, S. N., Malandkar, M. A., & Sacasa, F. J., 795 (Sp.)
Falcão, E. de C., 383 (Dys.)
Falcioni, D., 562 (Mal.)
Falkner, H., (456) (Y. & S.)
Fallas, S., & von Bülow, T., 16 (Y. & S.)
Falleroni, D., 136 (Mal.)
Farmachidis, C. B., 656 (Am.)
Farnell, F. J., & Yacovlev, P. J., 686 (Pel.)
Farnum, M. B., 785 (Bb.)
Farreras, P., 596 (R.F.)
Faust, E. C., 252, 745 (Hel.), 713 (Z.)
——, Ke-Fang, Y., Khaw, O. K., & Yung-An, C., 755 (Hel.)
——, & Khaw, O. K., 754, 755 (Hel.)
——, with Meleney & Wassell, 751 (Hel.)
——, with Morishita, 407 (Der.)
— —, & Nishigori, M., 249 (Hel.)
Favilli, G., 356, 725 (Und.)
Federated Malay States, 888 (Lab.)
Fédoulow, A. W., 862 (Z.)
Fedulow, A. W., with Kassirsky & Mosheiko, 94 (K.A.)
Feigenbaum, A., 921 (Oph.)
Feldt, A., & Schott, A., 112 (R.F.)
Ferguson, E. W., 713, 877, (Z.)
Ferguson, H. R. M., 71 (Bl.)
Fermi, C., 699 (Rab.)
Fernando, A. S., & Nicholas-Fernando, F., 72 (Misc.)
Ferreira, C., 326 (Tb.)
Ferrer Viera, M., with Perdomo Hurtado, 933 (Y. & S.)
Ferris, G. F., (304) (Z.)
Ferru, M., with Bruhl, 606 (Jaun.)
Fiallos, J. M., 632 (Misc.)
Fidao, G., 543 (Mal.)

Fiera, E. R., 616 (Pl.)
Fiessinger, N., & Parturier, G., 373 (Am.)
Fiorito, G., 371 (Am.)
Fischer, W., 21 (Y. & S.), 53 (S.S.), 471 (Misc.)
Fisher, A. B., with Taliaferro, 664 (Am.)
Fleischner, W., with Holst, 787 (Sc.)
Fleisher, M. S., with Wachowiak, 850 (Der.)
Fleming, G. W. T. H., 829 (Mal.)
Fleming, W. D., 218 (Misc.)
Fletcher, W., 144, 545 (Mal.)
Flu, P. C., 190 (Chl.), 486 (Misc.)
Flye Sainte-Marie, P. E., & Mansouri, A., 106 (K.A.)
Foà, G., 548 (Mal.)
Foley, H., Catanei, A., Brouard, M., & Demimuid, P., 133 (Mal.)
——, ——, ——, & Leblanc, L., 133 (Mal.)
——, ——, Le Guillas, L., & Brouard, M., 548 (Mal.)
——, & Meslin, R., 201 (Misc.)
——, with Parrot, 106 (K.A.)
——, with Sergent, Edm., & Et., Parrot, & Catanei, (564) (Mal.)
Fornara, L., 751 (Hel.)
Forster, E., 562 (Mal.)
Fassati, V., & Salvo, C., 563 (Mal.)
Fourche, J. A., 421 (S.S.)
Fox, C., 412 (B.R.)
Fox, L. W., 463 (Oph.)
Fraga, A., 19 (Y. & S.)
França, C., 199 (Rab.), 748 (Hel.)
Franchini, G., 284, 291, 874 (Z.), 370 (Am.), 588 (K.A.), 597 (R.F.), 601 (Fev.)
——, & Ghetti, G., 122 (Fev.)
——, und Mitarbeiten, 207 (Misc.)
Frankenberger, C., 627 (Misc.)
Franklin, J. C., 931 (Y. & S.)
Fraser, A. R., 27 (Y. & S.)
Frazier, C. N., 409 (Der.)
Freund, R., 55, 56 (S.S.)
Fribourg-Blanc, A., 556 (Mal.)
Friede, K. A., with Kritschewsky, 114 (R.F.)
Friederichs, K., 297 (Z.)
Fronville, G., 223, 232, 233 (Misc.)
Fry, A. B., (191) (Chl.)
Fujinami, A., 336 (Bb.)
Fujioka, N., (615) (Chl.)
Fujita, K., 673 (Dys.)
Fukuhara, Y., 671 (Dys.)
Fülleborn, F., 774 (Hel.)
Funaioli, G., 583 (K.A.)
Funk, K., with Collazo, 342 (Bb.)
Furutama, T., 878 (Z.)

G

Gage, A., 537 (Mal.)
Gage, E. H., 138 (Mal.)
Gaiski, N. A., 618 (Pl.)
Gaivoronsky, V., 277 (Z.).
Galán, J. C., with Castex, 704, 862 (Z.)
Galeati, A., 701 (Z.)
Galli-Valerio, B., 135 (Mal.)
Galloway, I. A., 111 (R.F.)
Galt, C. M., 604 (Fev.)
Gammel, J. A., Miskdjian, H., & Thatcher, H. S., 408 (Der.)
Ganguli, L. B., with Maitra & Basu, 187 (Chl.)
Ganguli, P., 315 (Tb.)
Ganguly, L., 187 (Chl.)
Ganter, M., & Kuijer, A., 451 (Y. & S.)
Garciá Faure, M., 32 (Am.)
Garcia, O., with Lacy, 193 (Ent.)
Garcin, R., with Apert & Kermorgant, 120 (Fev.)
——, with Salimbeni & Kermorgant, 121 *bis* 123 (Fev.)
Garlock, B., with Heller & McElroy, 340 (Bb.)
Garofali, F., 833 (Mal.)
de Gasperi, F., 359 *bis* (Und.)
Gaudet, L. S., 291 (Z.)
Gauducheau, A., 175 (Diet.)
Gauthier, A., 464 (Oph.)
Gavrila, with Labbé & Nepveux, 276 (Z.)
Gedoelst, L., 252 (Hel.)
Gelonesi, G., 179 (Pl.)
Gemayel, A., 529 (Mal.)
Genevray, J., 842 (Lep.)
——, with Herrmann, 255 (Hel.)
Genner, V., 453 (Y. & S.)
Georg, C. T., 938 (Y. & S.)
Gérard, F.; Salvo; Cortesi, 587 (K.A.)
Gerstmann, J., 496 (B.R.), 562 (Mal.)
Gharpure, P. V., with Rele, 322 (Tb.)
Ghetti, G., with Franchini, 122 (Fev.)
Ghiron, M., 432 (Bl.)
Ghosh, N., 541 (Mal.)
Ghosh, S., with Chopra, 218 *bis* (Misc.)
Ghosh-Dastidar, S. K., 187 (Chl.)
Gibson, R. M., 472 (Misc.)
Gibson, R. W. B., 245, 747 (Hel.)
Giemsa, G., 63 (S.S.), 629 (Misc.)
Gilbert, A., Tzanck, A., & Cabanis, 515 (Lep.)
Gill, C. A., 132 (Mal.), 615) (Chl.)
Girard, G., 180 (Pl.)
——, & Legendre, F., 292 (Z.)
Giraud, P., & Caudière, M., 577 (K.A.)
Gitowitsch, W., with Isabolinsky, 385 *bis* (Dys.)
Giuffré, M., 582 (K.A.)
Glaser, R. W., 862 (Z.)
Gloster, T. H., & Taylor, J., assisted by Menon, K. N., 696 (Rab.)
Gloukhoff, Sokolowa & Goremykina, 189 (Chl.)
Gloyne, S. R., with Christopherson, 628 (Misc.)
Göbl, A., 833 (Mal.)
Goebel, C., 563 (Mal.)
Goeckerman, W. H., with O'Leary & Parker, 556 (Mal.)
Gojcher, B., 564 (Mal.)
Gokhale, S. K., with Fairley, Mackie, Chitre, Gore, Malandkar & Sacasa, 795 (Sp.)
Goldberger, J., & Lillie, R. D., 681 (Pel.)
——, Wheeler, G. A., Lillie, R. D., & Rogers, L. M., 681 (Pel.)
——, ——, & Tanner, W. F., 172 (Pel.)
Gold Coast, 290 (Z.)
Gold Coast, Med. Res. Inst., 882 (Lab.)
Goldzieher, M., & Peck, S. M., 940 *bis* (G.V.)
Golov, D., & Joff, I., 618 (Pl.)
Golovanoff, (191) (Chl.)
Gomes, J. M., 510 (Lep.)
Gonzalez, C., with Mazza, 807 (Mal.)
Goodey, T., 759 (Hel.)
Goodman, H., 450 (Y. & S.)
Goodpasture, E. W., 693 (Rab.)
Gordon, R. M., 262 (Hel.)
——, with Blacklock, 130 (Mal.)

Gore, S. N., with Fairley, Mackie, Chitre, Gokhale, Malandkar & Sacasa, 795 (Sp.)
Goremykina, with Gloukhoff & Sokolowa, 189 (Chl.)
Gosio, B., 617 (Pl.)
Goto, K., with Kasuga, 42 (Dys.)
Gräff, S., 339 (Bb.)
Graham, G., 299 (Z.)
Graham, J. D., 98 (K.A.), (186) (Pl.), (191) (Chl.)
Graham, N. B., 149 (Mal.)
Grant, A. R., & Silverston, J. D., 826 (Mal.)
Grant, J. B., with Cort & Stoll, 264 (Hel.)
Greene, C. T., with Shannon, 872 (Z.)
Greenway, D., with Castex, 641 (Am.)
Gregg, A. L., with Low, 144 (Mal.)
——, with Manson-Bahr, 668 (Dys.)
Greig, E. D. W., & Christophers, S. R., 97 (K.A.)
Grekoff, 179 (Pl.)
Greval, S. D. S., & Row, C. K., 728 (Und.)
Grijns, G. W., 216 (Misc.)
Grixoni, G., 854 (B.R.)
Grjasnov, N. I., 199 (Rab.)
Grossmann, with Uhlenhuth, 599 (R.F.)
Guazon, P., (235) (Misc.)
Guéguen, R., 314 (Tb.)
Gueidon, E., with Sergent, Et., Catanei, Bouguet & Des Isles, 583 (K.A.)
Guérin, F., 706 (Z.)
Guérin, F. H., & Pons, R., 35, 663 (Am.)
Guerqué, A. A., 111 (R.F.)
Guerrero, G. L., 522 (Lep.)
Guillerm, J., with Bablet, 340 *bis* (Bb.)
——, with Borel, Pons & Advier, 553 (Mal.)
Guillet, R., with Mathis, 112 (R.F.)
Gulati, D. D., 928 (Y. & S.)
Günther, R., 489 (Misc.)
Guppy, H. B., 74 (Misc.)
Gupta, A., 321 (Tb.), 403 (Der.)
Gupta, B. M. D., 35 (Am.), 705 (Z.)
Gupta, B. N., 761 (Hel.)
Gupta, P. N., 108 (K.A.)
Gurewitsch, M., with Lewy, 911 (S.S.)
Gussew, V., (123) (Fev.)
Guthrie, J. B., 687 (Pel.)
Gutierrez, P. D., 17, 22 (Y. & S.)
——, & Villasenor, P. N., 449 (Y. & S.)

H

Hacker, H. P., 865 (Z.)
Haigh, W. E., 138 (Mal.)
Hames, R. T. M., with Pope, (236) (Misc.)
Halfer, G., 911 (S.S.)
Hall, A. H., 244 (Hel.)
Hall, G. R., 535 (Mal.)
Hall, M. W., 361 (Fev.)
——, with Siler & Hitchens, 360, 734 (Fev.)
Halliday, H., 174 (Diet.)
Hammerschmidt, J., 374 (Am.)
Hanau, R., with Dreyfus, 557 (Mal.)
Hanschell, H. M., 933 (Y. & S.), 938 (C.Bu.)
Hanson, H., 609, 611 (Y.F.)
——, & Dunn, L. H., 128 (Y.F.)
——, with ——, 612 (Y.F.)
Hapke, F., (78) (Misc.), (152) (Mal.)
Harada, S., 297 (Z.)
Harden, A., & Zilva, S. S., 178 (Diet.)
Hare, G. R., 919 (Oph.)
Hargreaves, H., 288 (Z.)
Harigopal, A. R., 764 (Hel.)
Harkins, M. J., 198 (Rab.)
Harris, D. T., (78) (Misc.)
Harris, N. M. 188 (Chl.)
Hartmann, A., 259 (Hel.)
Hartoch, O., with Schlossberger, 390 (Dys.)
Harty, A. H., 876 (Z.)
Harvey, J. L., with Cadbury & Jeu, 116 (R.F.)
Harvey, W. F., 213 (Misc.)
Hase, A., 765 (Hel.)
Hashimoto, T., 939 (C.Bu.)
Hassall, A., with Stiles, 535 (Mal.)
Hasson, J., 520 (Lep.)
Hauduroy, P., & Pacault, 354 (Und.)
Hauer, A., (235) (Misc.)
Haughwout, F. G., & Callender, G. R., 392 (Dys.)
Hausheer, W. C., 778 (Hel.)
——, with Stoll, 776 *bis* (Hel.)
Hayashi, N., 362 (Fev.)
Hayne, T. B., with Barber, 709 (Z.)
Heagerty, J. J., 612 (Y.F.)
Heal, G. F., 463 (Oph.)
Heerdjan, 18 (Y. & S.)
Hegner, R. W., 706, 861 (Z.)
——, & MacDougall, M. S., 863 (Z.)
Heineman, 559 (Mal.)
Heinemann, H., 29 (Y. & S.), 167 (Lep.), 220 (Misc.), 325 *bis* (Tb.)
Heller, V. G., McElroy, C. H., & Garlock, B., 340 (Bb.),
Helwig, F. C., 296 (Z.)
Hemmes, G. D., 853 (Der.)
Hempt, A., 196 (Rab.)
Hendriks, J. A., 16 (Y. & S.), 72 (Misc.)
Henrici, A. T., 189 (Chl.)
Herbert, H., 923 (Oph.)
d'Herelle, F., 182 (Pl.)
Herms, W. B., 273, 291 (Z.), 467 (Oph.)
Hernandez, L. G., with Ashford, 801 (Sp.)
Heron, G. W., 832 (Mal.)
Herrmann, O., 197, 200 *quat.* (Rab.)
Herrmann, R., & Genevray, J., 255 (Hel.)
Hertig, M., with Young, 579, 580 *bis* (K.A.)
Hesse, E., (835) (Mal.)
—, with Ebert, 120 (Fev.)
Hewetson, W. M., 66 (Bl.)
Hidaka, H., with Adachi, 125 (Jaun.)
Hidaka, S., 401, 402 (Der.)
Hieronymi, E., 297 (Z.)
Higuchi, S., 343 (Bb.)
Hill, O. A. R. B., 935 (Y. & S.)
Hill, R. B., 271 (Hel.)
Hilliard, E. T., 380 (Dys.)
Hindle, E., 124 (Jaun.)
——, & Brown, H. C., 123 (Jaun.)
——, & Duncan, J. T., 293 (Z.)
Hirayama, K., 377 (Am.)
Hirsch, E. F., with Mayers, 31 (Am.)
Hirst, L. F., 521 (Lep.), 774 (Hel.)
Hirst, S., 297 (Z.)
Hitchens, A. P., with Siler & Hall, 360, 734 (Fev.)
Hodgson, E. C., 888 (Lab.)
Hodson, V. S., 375, 653, 664 (Am.)
Hoesen, H. W., with van Dijke & Bakker, 21 (Y. & S.)
Hoff, H., & Horn, L., 595 (R.F.)
——, & Silberstein, F., 595 (R.F.)

Hoffmann, W. H., 77, 234 (Misc.), (128) *bis*, 610 (Y.F.), 607 *bis* (Jaun.), 785 *bis* (Bb.), 847 (Lep.)
Hogue, M. J., (722) (Z.)
Höjer, J. A., 79 (B.R.)
Holmes, F. O., 705 *ter* (Z.)
Holmes, M. J., & Richardson, A., 739 (Fev.)
Holst, A., & Fleischner, W., 787 (Sc.)
Home, W. E., 940 (C.Bu.)
van Hoof, L., 36 (Dys.), 526 (Mal.), 656 (Am.), 932 (Y. & S.)
Hopkins, F. S., 457 (H.S.)
Hopkins, R., with Denney, Wooley & Barentine, 162 (Lep.)
Horn, L., with Hoff, 595 (R.F.)
Hornaday, W. A., 46 (Sp.)
Horowitz-Wlassowa, L., 694 (Rab.)
Horvath, A. A., 785 (Bb.)
Hosford, G. N., & Shepardson, H. C., 923 (Oph.)
Hoshi, N., 39, 666 *bis* (Dys.)
Houdemer, M. E., 875 (Z.)
Houssay, B. A., & Mazzocco, P., 302 (Z.)
Howard, H. H., 264 (Hel.)
Howe, P. R., with Wolbach, 788 (Sc.)
Huang K'e-Kang, with Kessel, 662 (Am.)
Huchard, G. L., 71 *bis* (Bl.)
Hudadov, D. C., with Linhtrop, 587 (K.A.)
Huddleson, I. F., 725 (Und.)
Hudellet, G., & Moreau, G., 509 (Lep.)
Hudelo, Mouzon & Duhamel, 838 (Lep.)
Hudson, L. B., 171 (Pel.)
Hughes, T. A., 225 (Misc.), 550, 824 (Mal.)
Humphry, E., & McIntosh, R. D., 254 (Hel.)
Huppenbauer, C. B., 34 (680) *bis* (Am.)
Hutchinson, C. M., 488 (Misc.)

I

Iacono, L., 730 (Und.)
Icove, M. D., 924 (Oph.)
Iimura, (191) (Chl.)
Ikeda, T., 664 (Am.)
Ikegami, Y., 451, 930 (Y. & S.)
Illert, E., 591 (R.F.)
Imai, M., 592 (R.F.)
Imamura, A., with Nagayo, Tamiya, Sato, Miyagawa & Mitamura, 362 (Fev.)
Indian Medical Research Memoirs, 567 (K.A.)
Ingram-Johnson, R. E., (152) (Mal.)
Inhelder, H. E., 817 (Mal.)
Insfrán, J. V., 778 (Hel.)
Ioff, I. G., 137, 146 (Mal.)
——, with Wagner, 873 (Z.)
Ioff, J., 553 (Mal.)
Ioukowsky, K., with Yakimoff & Schirwind, (236) (Misc.)
Irimesco, G., with Ciuca, Manoliu, Alexa & Constantinesco, 546 (Mal.)
Irvine, A. C., 448 *bis* (Y. & S.)
Isabolinsky, M., & Gitowitsch, W., 385 *bis* (Dys.)
——, & Zeitlin, A., 691 (Rab.)
Ishiwara, K., & Ogata, N., 362 (Fev.)
Isobe, M., 257 (Hel.)
Ito, M., 119 (R.F.)
Ito, W., 344 (Bb.)
Ivanoff, E., 278 (Z.), (918) (S.S.)
Iwaschenoff, G., 591 (R.F.)
Iyengar, K. R. K., 488 (Misc.)
——, with Caius & Anderson, 299 (Z.)
Iyengar, M. O. T., 709, (722) (Z.), 831 (Mal.)
Iyer, P. V. S., with Turkhud & Krishnan, 574 (K.A.)
Izar, G., 730 (Und.)
Izeki, K., 119 (R.F.)

J

Jack, R. W., 719 (Z.)
Jackson, M., 235 (Misc.)
Jacob, K. K., 616 (Pl.)
Jaffé, L., 251 (Hel.)
Jahnel, F., & Lange, J., 18 (Y. & S.)
——, with Plaut, 937 (Y. & S.)
James, S. P., 804 (Mal.)
——, with Edwards, 285 (Z.)
——, assisted by Shute, P. G., 804 (Mal.)
Jamison, S. C., (78) (Misc.)
——, with Johns, 375 (Am.)
Jamot, E., 420, 900 (S.S.)
——, with Tanon, 52 (S.S.)
Jansen, B. C. P., 176 (Diet.)
Japanese Journal of Medical Sciences, 80 (B.R.)
Jarland, 226 (Misc.), 924 (Oph.)
Jaumain, D., & Colard, A., 441 (Myc.)
——, with Colard, 442 (Myc.)
Jeanselme, 157 (Lep.)
—— & Burnier, 588 (K.A.)
Jeftichev, 617 (Pl.)
Jemma, R., 99 (K.A.)
Jerwood, B. E., 675 (Dys.)
Jettmar, H. M., 183, 185 (Pl.)
Jeu, L. N., with Cadbury & Harvey, 116 (R.F.)
Jewett, M. L., 292 (Z.)
Jhaveri, M. H., 563 (Mal.)
Jiménez, J. B., 440 (Myc.)
Joannovitch, G., 196 (Rab.)
Jobson, E. W. C., 651 (Am.)
Joekes, T., 602 (Fev.)
Joff, I., 720 (Z.)
——, with Golov, 618 (Pl.)
Johns, F. M., & Jamison, S. C., 375 (Am.)
Johnson, G., & Breidigain, F. T., 45 (Sp.)
Johnson, H. A., (722) (Z.)
Johnson, W. B., 118 (R.F.), 427 (S.S.)
Johnston, H. B., 297 (Z.)
Johnston, T. H., 288 (Z.)
de Jong, J. J., 833 (Mal.)
de Jongh, J., 830 (Mal.)
Jordan, A., 453 (Y. & S.)
José Viton, J., 657 (Am.)
Joseph, H. P., 781 (Hel.)
Journal de Médecine de Bordeaux, 699 (Rab.)
Journal of the Port-of-Spain Medical Society, 1924, 637 (B.R.)
Jovanovic, M., with Alivisatos, 672 (Dys.)
Joyeux, C., 720, (880) (Z.), 741 (Hel.)
Juan Rivero, A., 649 (Am.)
Judhisthir Das, with Brahmachari, 100 (K.A.)
Juillet, A., & Diacono, H., 294 (Z.)
Junkin, C. I., 577 (K.A.)

K

Kabeshima, T., 191 (Chl.)
Kagosima, S., with Ogata, Kauakita, & Suzuki, (786 *bis*) (Bb.)

Kalantarian, E. W., 742 (Hel.)
Kanagarayer, K., with Kingsbury, 143 (Mal.)
Kapsenberg, G., 620 (Pl.)
Kartacheff, E. V., 592 (R.F.)
Karve, S. D., 817 (Mal.)
Karwacki, L., 110 (R.F.)
Kasama, Y., with Kawamura, 752 (Hel.)
Kasauli Pasteur Institute of India, 697 (Rab.)
Kassirsky, J. A., Mosheiko, W. M., & Fedulow, A. W., 94 (K.A.)
Kasuga, K., & Goto, K., 42 (Dys.)
——, & Tamura, I., 587 (K.A.)
Katô, J., 607 (Jaun.)
Katô, Y., 849 (Der.)
Katsunuma, S., (235) (Misc.)
Katsurada, F., 377 (Am.)
Kauakita, S., with Ogata, Suzuki & Kagosima, (786 *bis*) (Bb.)
Kauders, O., 555 (Mal.)
Kauffmann, 629 (Misc.)
Kauntze, W. H., 884 (Lab.)
Kawamura, H., & Tsuchiya, K. (400) (Dys.)
Kawamura, R., & Kasama, Y., 752 (Hel.)
Kawatani, S., 699 (Rab.)
Käyser, J. D., 511 (Lep.)
Keevill, A., 907 (S.S.)
Ke-Fang, Y., with Faust, Khaw & Yung-An, 755 (Hel.)
Kellersberger, E. R., 51, 906 (S.S.)
Kenrick, W. H., 131 (Mal.)
Kenya Medical Journal, 405 (Der.)
Kenya, Rep. Bacteriol. Lab., 884 (Lab.)
Kérandel, J., 711 (Z.)
Kerim, F., (835) (Mal.)
Kermorgant, Y., with Apert & Garcin, 120 (Fev.)
——, with Salimbeni & Garcin, 121 *bis*, 123 (Fev.)
Kerr, W. J., 923 (Oph.)
Kervrann, 139 (Mal.)
Kessel, J. F., 273 (Z.)
——, & Huang K'e-Kang, 662 (Am.)
——, & Willner, O., 30 (Am.)
Kessler, A., 69 (Bl.), 211 (Misc.)
Kew Bulletin of Misc. Information, 515 (Lep.)
Khalil, M., 779 (Hel.)
Khan, M., 651 (Am.)
Kharegab, R., 231 (Misc.)
Khaw, O. K., with Faust, 754, 755 (Hel.)
——, with ——, Ke-Fang & Yung-An, 755 (Hel.)
Kiang, T. S., 57 (S.S.)
Kikuth, W., 436 (Bl.)
Kimura, H., 228 (Misc.)
Kimura, T., Suda, H., & Kishida, K., 297 (Z.)
King, H. H., 235 (Misc.)
——, Nicholas, M. J., & Lahiri, B. N., 697 (Rab.)
——, with Stevenson, Nicholas & Lahiri, 697 (Rab.)
King, J. C., 905 (S.S.)
Kinghorn, A., 48 (S.S.)
Kingsbury, A. N., 75 (Misc.), 533 (Mal.), 778 (Hel.)
——, & Kanagarayer, K., 143 (Mal.)
Kipschidse, N., with Chatridse, 863 (Z.)
Kirby-Smith, J. L., 407 (Der.)
——, Dove, W. E., & White, G. F., 781 (Hel.)
Kirk, J. B., 181 (Pl.)
——, with Yeager, 270 *bis* (Hel.)
Kirkpatrick, H., 237 (B.R.), 459, 919 (Oph.)
Kirkpatrick, T. W., 285 (Z.)
Kirkwood, R. C., with Callender & Shepard, 319 (Tb.)
Kirschner, L., & Kunst, C., 355 (Und.)
——, with Otten, 389 (Dys.)
Kishida, K., with Kimura & Suda, 297 (Z.)
Kitayama, K., with Koshina & Shiozawa, 598 (R.F.)
Klemperer, P., with MacNeal, 33 (Am.)
Kligler, I. J., 581 (K.A.), (152), 809 (Mal.)
——, & Weitzman, L., 56 (S.S.), 860 (Z.)
Kline, B. S., & Berger, S. S., 116 (R.F.)
Kling, C., 828 (Mal.)
Klugh, G. F., 39 (Dys.)
Knack, A. V., 699 (Rab.)
Knapp, A., 465 (Oph.)
Knipping, H. W., 217 (Misc.)
Knoller, G., 259 (Hel.)
Kobayashi, C., 301 (Z.)
Koch, J., 691 (Rab.)
Koch, K., 489 (Misc.)
Koetsier, J. H., & Ziesel, H. J., 380 (Dys.)
Kofoid, C. A., (722) (Z.)
——, & Allen, E. A., (722) (Z.)
——, with Boyers & Swezy, 365 (Am.)
——, & Swezy, O., (304) (Z.)
——, & Wagener, E. H., 659 *bis*, 663 (Am.)
Köhler, 678 (Dys.)
Kohno, Y., (44) (Dys.)
Koino, S., 257 (Hel.)
Kollath, W., & Leichtentritt, B., 487 (Misc.)
Kollewijn, J. R., 833 (Mal.)
Kondo, S., 671 (Dys.)
Kopstein, F., 507 (Lep.), 623 (Misc.)
Kō-Ran, 287 (Z.)
——, with Maruyama, 614 (Chl.)
Korke, V. T., 267, 768 (Hel.)
Korns, J. H., 317 (Tb.)
Korteweg, P. C., 811 (Mal.)
Koshina, M., Shiozawa, S., & Kitayama, K., 598 (R.F.)
Koun, 833 (Mal.)
Kourilsky, R., with Sergent & Mignot, 727 (Und.)
Kouwenaar, W., 479 (Misc.)
Kovács, N., with Eisler, 614 (Chl.)
——, with Kraus & Awoki, 389 (Dys.)
Krantz, W., 594 (R.F.)
Kraus, R., 300 *ter*, 301, 878 (Z.), 912 (S.S.)
——, Awoki, T., & Kovács, N., 389 (Dys.)
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Krikorian, K. S., with Stuart, 695 (Rab.)
Krishnan, K. V., with Turkhud & Iyer, 574 (K.A.)
Kritschewsky, J. L., & Friede, K. A., 114 (R.F.)
——, & Ljass, M. A., 115 (R.F.)
——, & Tscherikower, R. S., 599 (R.F.)
Kroó, A., 60 (S.S.)
——, with Buschke, 119 (R.F.)
Kroó, H., 112 (R.F.), 915 (S.S.)
Kropveld, A., 151 (Mal.)
Kubo, T., with Adachi, 42 (Dys.)
Kudicke, R., 242 (Hel.)
Kudo, R., 284 (Z.)
Kuhn, P., 633 (Misc.), 910 (S.S.)
——, & Schmidt, H., 628 (Misc.)

Kuhn, P., with Uhlenhuth & Schmidt, 482 (Misc.)
Kühnhold, G., 558 (Mal.)
Kuijer, A., with Ganter, 451 (Y. & S.)
Külz, L., 473 (Misc.)
Kundu, S., 578 (K.A.)
Kunst, C., with Kirschner, 355 (Und.)
Kurup, P. K., 43 (Dys.)
Kussitasseff, K., with Seyfarth & Sarafoff, 111 (R.F.)

L

Labbé, M., Nepveux, F., & Gavrila, 276 (Z.)
Labernadie, V. G. F., 807 (Mal.)
La Bier, C. R., 362 (Fev.)
Lacroix, A., with Raynaud, Béraud & Boutin, 935 (Y. & S.)
Lacy, G. R., 386 (Dys.)
— —, & Garcia, O., 193 (Ent.)
La Face, L., 713 (Z.)
Lafenêtre, with Aublant, Dubois & Lisbonne, 349 (Und.)
Lafforgue, M., 109 (R.F.)
La Grèce Médicale, 198 (Rab.)
Lahiri, B. N., with King & Nicholas, 697 (Rab.)
——, with Stevenson, King & Nicholas, 697 (Rab.)
Laidlaw, P. P., with Dobell, 660 (Am.)
Laigret, 699 (Rab.), 425, 900 (S.S.)
——, & Blanchard, M., 57 (S.S.)
——, with ——, 408 (Der.), 58, 898 (S.S.)
Lal, R. B., 553 (Mal.)
Lalung-Bonnaire, P., & Pons, R., (193) (Ent.)
Lambert, A., with Bernard, 337 (Bb.)
Lambert, S. M., 743 (Hel.)
Lamberts, W. H., 642 (Am.)
Lambright, G. L., 799 (Sp.)
Lampe, P. H. J., 321 (Tb.), 749 *bis*, 750 (Hel.)
Lancelin, Seguy & Dubreuil, 732 (Und.)
Landrieu, M., & Senevet, G., 530 (Mal.)
Landsteiner, K., & Van der Scheer, J., 916 (S.S.)
Lane, C., 261 (Hel.), 331, 833 (Mal.)
Lanford, J. A., 604 (Fev.)
Lanfranchi, A., 698 (Rab.)
Lange, J., with Jahnel, 18 (Y. & S.)
de Langen, C. D., (236), 494 (Misc.), 338 (Bb.)
Langeron, J., 72, (236) (Misc.)
Langeron, M., 286, 713 (Z.), 848 (Der.)
Lantin, P. T., 377 (Am.)
Large, D. T. M., & Bonavia, V. J., 824 (Mal.)
La Terza, E. (400) (Dys.)
Latham, D. V., 750 (Hel.)
Launoy, L., & Nicholle, P., 910 (S.S.)
Laurentier, C., with Chatellier, (847) (Lep.)
Lavier, G., 62 (S.S.)
League of Nations, 137, 138 *ter*, 804 (Mal.), 411 (B.R.)
Lebedev, F. N., 184 (Pl.)
Leber, A., 402 (Der.)
Leblanc, L., with Brouard, 313 (Tb.)
——, with Foley, Catanei & Brouard, 133 (Mal.)
LeBlanc, T. J., 126 (Y.F.)
Lebon, J., with Chiray, 276 (Z.)
Leclerc, H., (236) (Misc.)
Le Cousse, E., 181 (Pl.)
Ledhard, H. A., 258 (Hel.)
Ledingham, J. C. G., 675 (Dys.)
Lee, C. U., 170 (Pel.)
Lee, T. P., 466 (Oph.)
Le Fanu, G. E. H., 611 (Y.F.)
Lefrou, G., 448 (Y. & S.), 747 (Hel.)
Legendre, F., 163 (Lep.)
——, with Girard, 292 (Z.)
Leger, A., 702 (Z.)
Leger, M., 23 (Y. & S.), 126 (Y.F.), 263 (Hel.), (918) (S.S.)
Le Guillas, L., with Foley, Catanei & Brouard, 548 (Mal.)
Leichtentritt, B., 61 (S.S.)
——, with Kollath, 487 (Misc.)
Leiva, L., with de Leon, 251 (Hel.)
de Lemos, B., 563 (Mal.)
de Leon, W., & Leiva, L., 251 (Hel.)
Le Prince, J. A., 804 (Mal.)
Le Roy des Barres, 26 (Y. & S.)
Lesbre, P., 40 *bis* (Dys.)
Lester, A. R., 885 (Lab.)
Lestoquard, F., with Parrot, 103 (K.A.)
Leulier, with Mouriquand, 348 (Sc.)
Leupold, F., 60 (S.S.)
Levaditi, C., 211 (Misc.)
——, & Nicolau, S., 593 (R.F.)
Levene, P. A., & Van der Hoeven, B. J. C., 342 (Bb.)
Levy, D. M., 406 (Der.)
Lévy, R., 300 (Z.)
Lewis, K. M., 905 (S.S.)
Lewis, W. H., 799 (Sp.)
Lewy, F., & Gurewitsch, M., 911 (S.S.)
Lhuerre, H., 74, 77 (Misc.)
——, with Nogue, 24 (Y. & S.)
Li, T. M., 466 (Oph.)
Libert, E., 704 (Z.)
Licht, H., with Quast, 689 (Rab.)
Lichtenstein, A., 192 (Ent.), 215 (Misc.)
Lillie, R. D., with Goldberger, 681 (Pel.)
— , with ——, Wheeler & Rogers, 681 (Pel.)
Lindall, A. L., 371 (Am.)
Lindsay, B., & Medes, G., 348 (Sc.)
Lindsay, J. W., Rice, E. C., & Selinger, M. A., 634 (Misc.)
Lindtrop, G. T., with Amosov, 538 (Mal.)
Lindtrop, H., 267 (Hel.), 868 (Z.)
Ling, W. P., 98 (K.A.), 466 (Oph.)
Linhtrop, G. T., & Hudadov, D. C., 587 (K.A.)
Lins, A., 598 (R.F.), 607 (Jaun.)
Lippincott, L. S., 38 (Dys.)
Lisbonne, with Aublant, Dubois & Lafenêtre, 349 (Und.)
Lister, S., (78) (Misc.)
Little, E. G. G., (847) (Lep.)
Ljahowetsky, A., (835) (Mal.)
Ljass, M. A., with Kritschewsky, 115 (R.F.)
Lloyd, J., (186) (Pl.)
Lloyd, L., 54 (S.S.)
Lloyd, R. B., 29 (Y. & S.)
——, & Mitra, G. C., 825 (Mal.)
——, Napier, L. E., & Smith, R. O. A., 95 (K.A.)
Lobo, G. J., 220 (Misc.)
Loevenbruck, (78) (Misc.)
van Loghem, J. J., (186) (Pl.), (191) (Chl.)
Lokhov & others, 720 (Z.)
Lopes, A. J., with Strada, 423 (S.S.)
Lorenzo, R., with Castex, 760 (Hel.)
di Loreto, O., (123) (Fev.)

Lossouarn, E., 925 (Oph.)
Lotti, C., & Manai, A., 231 (Misc.)
Louet, L., with Louste & Darquier, 326 (Tb.)
Louste, A., Louet, L., & Darquier, J., 326 (Tb.)
Louw, G., 904 (S.S.)
Low, G. C., & Cooke, W. E., 938 (C.Bu.)
—, & Gregg, A. L., 144 (Mal.)
Löwenstein, E., with Bächer & Kraus, (304) (Z.)
Lucas, C. L. T., with Thomson, 664 (Am.)
Lucas-Championnière, M. S., 399 (Dys.)
Ludlow, A. I., with Choy, 754 (Hel.)
Luger, A., 742 (Hel.)
Lukowa, A. J., 825 (Mal.)
Lumbroso, U., with Durand, 919 (Oph.)
——, with Nicolle, 920, 921 (Oph.)
Lumsden, K., 904 (S.S.)
Lustig, A., 136 (Mal.)
Lwoff, A., with Colas-Belcour, 701(Z.)
Lynch, K. M., 861 (Z.)
Lyon, B. B. V., & Swalm, W. A., 275 (Z.)
Lyon, Jr., M. W., 758 (Hel.)

M

Maass, E., 405 (Der.)
Mac Arthur, W. P., 155, 523 (Lep.), 620 (Pl.)
MacCallan & Péretz, 459 (Oph.)
McCarrison, R., 174 (Diet.)
Macciotta, G., 140 (Mal.)
McConnell, R. E., & McGill, C. M., 465 (Oph.), 537 (Mal.)
McCulloch, W. E., 109 (R.F.)
Macdonald, G., 808 (Mal.)
Macdonald, N., with Marshall, 214 (Misc.)
MacDougall, M. S., with Hegner, 863 (Z.)
Mac Dowel, A., 607 (Jaun.)
McElroy, C. H., with Heller & Garlock, 340 (Bb.)
McGill, C. M., with McConnell, 465 (Oph.), 537 (Mal.)
MacGill, E., with Patton, 285 (Z.)
McGrath, M. J., with Bolton, 37 (Dys.)
MacGregor, M. E., 709 (Z.)
Maciel, H., 751 *bis* (Hel.)
McIntosh, R. D., with Humphry, 254 (Hel.)
McKay, A. C., 753 *bis* (Hel.)
Mackehenie, D., & Weiss, P., 363 (Fev.)
McKendrick, A. G., 194, 689 (Rab.)
McKenzie, A., 239 (Hel.), 445 (Y. & S.)
MacKeown, R. J., 135 (Mal.), 355 (Und.)
Mackie, F. P., 887 (Lab.)
——, with Fairley, assisted by Chitre, Gokhale, Gore, Malandkar & Sacasa, 795 (Sp.)
Mckinsky, R. N., & Zau, F. D., (615) (Chl.)
Macmillan, R. J. A., 431 (Bl.)
MacNaught, W. W., (458) (H.S.)
McNaughton, J. G., 933 (Y. & S.)
MacNeal, W. J., & Klemperer, P., 33 (Am.)
MacPherson, J., 213 (Misc.)
McRobert, G. R., 233 (Misc.), 397 (Dys.)
Macvicar, N., 78 (Misc.)
Madras, 925 (Oph.),
de Magalhães, O., 442 (Myc.)
Mainini, C., 540 (Mal.)
Maire, G., 676 (Dys.)
Maire, G. L. E., & Sabbagh, A., 810 (Mal.)
Maitra, G. C., & Basu, J. B., (191), 614 (Chl.)
—— , Ganguli, L. B., & Basu, J. B., 187 (Chl.)
Maity, B. B., with Brahmachari, 100 (K.A.)
Makarowa, J., & Zeiss, H., 632 (Misc.)
Malagueta, I., (835) (Mal.)
Malandkar, M. A., with Fairley, Mackie, Chitre, Gokhale, Gore & Sacasa, 795 (Sp.)
Malariacommissie voor Noordholland, 811 (Mal.)
Malaussène, 834 (Mal.)
Mallory, F. B., (236) (Misc.)
Malone, R. H., 699 (Rab.)
——, Avari, C. R., & Naidu, B. P. B., 183 (Pl.)
Manai, A., with Lotti, 231 (Misc.)
Manalang, C., 272, 779 (Hel.)
Mangabeira-Albernaz, P., 852 (Der.)
Manifold, J. A., 395, 674 (Dys.)
Manolin, E., with Ciuca, Irimesco, Alexa & Constantinesco, 546 (Mal.)
Manouélian, Y., & Viala, J., 692 (Rab.)
Manson-Bahr, P. H., 98 (K.A.), 653 (Am.), 761 (Hel.)
——, & Gregg, A. L., 668 (Dys.)
——, & Morris, R. M., 33, 652 (Am.)
——, with Newham & Morris, 797 (Sp.)
Mansouri, A., with Flye Sainte-Marie, 106 (K.A.)
Manteufel, P., 119 (R.F.)
——, & Worms, W., 110 (R.F.)
Maplestone, P. A., 777 (Hel.)
——, with Yorke, 328 (B.R.)
Marcellus, M. B., 862 (Z.)
Marcenac, M., 721 (Z.)
Marchiafava, E., 812 (Mal.)
Marchoux, E., 158 (Lep.), 812 (Mal.)
——, & Raynaud, L., 136 (Mal.)
Mariani, G., 160 (Lep.)
Marie, A., 150, 557 (Mal.)
Marshall, A., & Macdonald, N., 214 (Misc.)
Marshall, C. H., & Vassallo, S. M., 908 (S.S.)
Marshall, W. J., 613 (Chl.)
Martin, F. H., (236) (Misc.)
Martin, S. H., 219 (Misc.)
Martindale, W. H., 550 (Mal.)
——, with Willmore, 645 (Am.)
Martini, E., 135 (Mal.) 304, 721 (Z.)
Martinelli, G., (186) (Pl.)
Maruyama, Y., 184, 619 (Pl.)
——, & Ko-Ran, 614 (Chl.)
Marzinowsky, E. J., 105 (K.A.)
Mason, E. L., 235 (Misc.)
Mason, F. A., with Fairbrother, Perkin & Renshaw, 59 (S.S.)
Masselot, F., with Burnet, 94 *bis* (K.A.)
——, with ——, Calamida & Ortona, 94 (K.A.)
Massias, C., 144 (Mal.)
Matarangas, G., 508 (Lep.)
Mathis, C., & Guillet, R., 112 (R.F.)
Mathur, S. N., & Zutshi, K. N., 119 (R.F.)
Mattei, C., 484 (Misc.)
Mattlet, G., 739 (Fev.)
Matuschka, J., 685 (Pel.)
Maurer, E., 258 (Hel.)
Mauriac, P., 829 (Mal.)
Mauritius, 886 (Lab.)
Maxwell, J. P., 177 (Diet.)
Mayer, M., 103 (K.A.)
Mayers, L. H., & Hirsch, E. F., 31 (Am.)
Mayne, B., 867 (Z.)
Mazumdar, B., 93 (K.A.)
Mazza, S., 300 (Z.), 914 *bis* (S.S.)
— —, Cossio, R., & Aybar Albarracin, A., 822 (Mal.)

Mazza, S., & González, C., 807 (Mal.)
Mazzocco, P., with Houssay, 302 (Z.)
Mazzolani, D., 526 (Mal.)
Medes, G., 789 (Sc.)
——, with Lindsay, 348 (Sc.)
Medical Research Council, 141 (Mal.)
Medical & Scientific Archives of the Adelaide Hospital, 738 (Fev.)
Medina Jiménez, R., 848 (Der.)
Mehta, V. N., 935 (Y. & S.)
Meissner, K., 562 (Mal.)
Meleney, H. E., 583 (K.A.)
——, Faust, E. C., & Wassell, C. M., 751 (Hel.)
de Mello, F., 115, (119), (R.F.), 220 (Misc.), 519 (Lep.)
——, Brás de Sá, & de Menezes, C. F., 150 (Mal.)
de Mello, O., 301 (Z.)
Melnotte, P., with Baqué, Céard & Dekester, 820 (Mal.)
Menaut, B., with Alexis, 164 (Lep.)
Mendelson, R. W., 475 (Misc.)
Mendoza-Guazon, M.P., with Africa, 764 (Hel.)
de Menezes, C. F., with de Mello & Brás de Sá, 150 (Mal.)
Menon, K. N., with Gloster and Taylor, 696 (Rab.)
Mense, C., 497 (B.R.)
Mersch, 748 (Hel.)
Mertens, W. K., & Rademaker, G. A., 670 (Dys.)
Meslin, R., with Foley, 201 (Rab.)
Mesquita, B. P., 599 (R.F.)
Meyer, E., (564) (Mal.)
Meyer, K., 390 (Dys.)
Mgebrow, M. L., 728 (Und.)
Michael, D. F., 93 (K.A.)
Michaux, A., with Randoin, 347 (Sc.)
Micheli, F., 355 (Und.)
Micheloni, L. A., 117 (R.F.)
Miessner, H., & Baars, G., 697 (Rab.)
Mignot, with Sergent & Kourilsky, 727 (Und.)
Mikeladse, S., 553 (Mal.)
Mikéladzé, C., 800 (Sp.)
Miki, R., 596 (R.F.)
Millard, R. J., 837 (Lep.)
Miller, J. E., 439 (Myc.)
Miller, R., 679 (Dys.)
Miller, R. S., 169 (Pel.)
Millet, A. H., 920, 921 (Oph.)
Millous, P., 538 (Mal.)
Mills, P. S., 296 (Z.)
Mills, R. G., 74 (Misc.)
Minett, E. P., 192 (Ent.)
Mirolubova, E. J., 694 (Rab.)
Mirtl, C., 296 (Z.)
Mirzoian, A. A., 834 (Mal.)
Miskdjian, H., with Gammel & Thatcher, 408 (Der.)
Missiroli, A., with Alessandrini, (722) (Z.)
Mitamura, T., with Nagayo, Tamiya, Imamura, Sato & Miyagawa, 362 (Fev.)
Mitchell, G. F., 675 (Dys.)
Mitra, G. C., with Lloyd, 825 (Mal.)
Mitra, N. C., 578 (K.A.)
Mitra, P. N., 879 (Z.)
Miyagawa, Y., 269 (Hel.)
——, with Nagayo, Tamiya, Imamura, & Mitamura, 362 (Fev.)
Moncarey with Dubois, 22 (Y. & S.)
Monge, C. M., 363 (Fev.)
Monteleone, R., 147 (Mal.)
Montenegro, J., 585 (K.A.)
Montes, J. E., (786) (Bb.)
Montgomerie, R. F., 753 *ter* (Hel.)
Montilla, L. E., (236) (Misc.)
Moodie, R. L., 942 (B.R.)
Mook, W. H., & Weiss, R. S., 682 (Pel.)
Moore, J., 698 (Rab.)
Moore, V. A., & Carpenter, C. M., 724 (Und.)
Mooser, H., 121, 122 (Fev.)
Moragas y Gracia, R., 206 (Misc.)
Morax, V., 463 *bis* (Oph.)
Mörch, J. R., 829 (Mal.)
Moreau, G., with Hudellet, 509 (Lep.)
Moretti, P., 641 (Am.)
Morin, H. G. S., 141, 551 (Mal.)
Morishima, K. I., 670 (Dys.)
Morishita, K., 361 (Fev.), 286 (Z.)
——, & Faust, E. C., 407 (Der.)
Morris, R. M., with Manson-Bahr, 33, 652 (Am.)
——, with Newham & Manson-Bahr, 797 (Sp.)
Moses, H. M., 765 (Hel.)
Mosheiko, W. M., with Kassirsky & Fedulow, 94 (K.A.)
Motais, 460, 461 (Oph.), 936 (Y. & S.)
Mouchet, M., 405 (Der.)
Moufell, P. P., 818 (Mal.)
Mouriquand, G., 688 *bis* (Pel.)
——, & Bernhein, M., 347 (Sc.)
——, & Leulier, 348 (Sc.)
Mouzon, with Hudelo & Duhamel, 838 (Lep.)
Mras, F., 556 (Mal.)
Mudaliar, M. R. G., Raman, T. K., & Raman Menon, K., 575 (K.A.)
Mueller, E. A., 44 (Dys.)
Mühlens, P., 33 (Am.), 554 (Mal.), 587 (K.A.)
Muir, E., 845, 846 (Lep.)
Mukherjee, H. N., 626 (Misc.)
Mukherjee, S. K., 464 (Oph.)
Mukherji, G. N., 316 (Tb.)
Mukherji, S. K., 664 (Dys.)
Mulder, D. G., 452, 936 (Y. & S.)
Müller, H., 634 (Misc.)
Muller, H. R., & Blaisdell, C. B., 126 (Y.F.)
Müller, L., 387 (Dys.)
Müller, R., (236) (Misc.)
Munter, F., 62 (S.S.)
Muradowa, A. B., 377 (Am.)
Murison, C. C., 235 (Misc.)
Muto, M., & Sasaki, N., 258 (Hel.)

N

Nagayo, M., Tamiya, T., Imamura, A., Sato, K., Miyagawa, Y., & Mitamura, T., 362 (Fev.)
Naidu, B. P. B., with Malone & Avari, 183 (Pl.)
Nakadate, K., (78) (Misc.)
Nakamura, K., 386 (Dys.)
Namikawa, H., 917 (S.S.)
Napier, L. E., 101, 579 (K.A.)
——, with Lloyd & Smith, 95 (K.A.)
Narasimhan, N. S., (78) (Misc.)
Nasso, I., 442 (Myc.)
Nazareth, F. X. de S., (186) (Pl.)
Nebert, H., 765 (Hel.)

Nedergaard, N., 212 (Misc.), 875 (Z.)
Nederlandsch Tijdschrift voor Geneeskunde, 223 (Misc.)
Neff, E. A., 838 (Lep.)
Nejrotti, G. M., 604 (Fev.)
Nepveux, F., with Labbé & Gavrila, 276 (Z.)
Neumann, F., 633 (Misc.)
Neumark, E., & Pogorschelsky, H., 61, 916 (S.S.)
Newham, H. B., 249 (Hel.), 801 (Sp.)
——, & Morris, R. M., with Manson-Bahr, P. H., 797 (Sp.)
Nicholas, M. J., with King & Lahiri, 697 (Rab.)
——, with Stevenson, King, & Lahiri, 697 (Rab.)
Nicholas-Fernando, F., with Fernando, 72 (Misc.)
Nicholls, L., 73 (Misc.), 757, 781 (Hel.)
Nichols, H. J., 450 (Y. & S.)
Nicolau, S., with Levaditi, 593 (R.F.)
Nicole, J. E., & Steel, J. P., 557, 558, (835), (Mal.)
Nicolle, C., 584 (K.A.), 920 (Oph.)
——, & Anderson, C., 96, 104 (K.A.)
——, & Lumbroso, U., 920, 921 (Oph.)
Nicolle, P., 226 (Misc.)
——, with Launoy, 910 (S.S.)
Nigeria, 716 (Z.)
Nigeria, Ann. Rep. Med. Res. Inst., 881 (Lab.)
Nikanoroff, S. M., 618 (Pl.)
Nikanorov, S. M., 184 (Pl.)
Nikanorow, S. M., 616 (Pl.)
Nikolai, A., & Tijssen, J., 73 (Misc.)
Nikolajewa, E., 197 (Rab.)
Nikolajvić, B., 823 (Mal.)
Niño, F. L., 399 (Dys.), 859 (Z.)
Nishigori, M., 260 (Hel.)
——, with Faust, 249 (Hel.)
Nishino, T., 765 (Hel.)
van Nitsen, R., 233 (Misc.), 527 (Mal.)
——, with Rouvroy, 434 (Bl.)
Nobechi, K., 188 (Chl.)
Nocht, B., 151, 563 (Mal.), 434 (Bl.)
Noguchi, H., 127 (Y.F.), 601 (R.F.), 736 (Fev.)
——, & Battistini, T. S., 738 (Fev.)
Nogue, 589 (R.F.)
——, & Lhuerre, H., 24 (Y. & S.)
Nonne, M., 555 (Mal.)
Nossine, V. K., 834 (Mal.)
Nunez, S., 446 (Y. & S.)
Núñez Tovar, M., 285, 713 (Z.)
Nutt, M. M., with Wilson, 732 (Und.)
Nuttall, G. H. F., Warburton, C., & Robinson, L. E., 413 (B.R.)
Nuzum, F. R., 683 (Pel.)

O

Odaka, Y., 293 (Z.)
Oddo, C., 354 (Und.)
Ogata, N., with Ishiwara, 362 (Fev.)
Ogata, S., 256 (Hel.)
Ogata, T., Kauakita, S., Suzuki, S., & Kagosima, S., (786 *bis*) (Bb.)
Ohba, T., 257 *bis* (Hel.)
Ohhira, A., 343, 344 (Bb.)
Ohhira, K., 343 (B6.)
Ohiso, T., with Yokokawa, 269 *bis* (Hel.)
Oi, 282 (Z.)
Oi, T., 550 (Mal.)
Oiso, T., with Yokogawa, 776 (Hel.)
Okuda, M., 255 (Hel.)
——, with Takeshita, 255 (Hel.)
Oldt, F., 463 (Oph.)
O'Leary, P. A., Goeckerman, W. H., & Parker, S. T., 556 (Mal.)
de Oliveira, O., with de Almeida, 928 (Y. & S.)
Oliver, J., 514 (Lep.)
Olivier, J., 898 (S.S.)
Olmer, D., 934 (Y. & S.)
Oostingh, R., 193 (Ent.)
Oppenheim, F., 470 (Misc.)
Orcutt, M. L., 729 (Und.)
Orishita, K., 286 (Z.)
Ornstein, I., 172 (Pel.)
Ortona, C., with Burnet, Masselot, & Calamida, 94 (K.A.)
Ortuño Gonzalez, J., with d'Amato, 372 (Am.)
Otten, L., & Kirschner, L., 389 (Dys.)
Ovazza, V. E., 145 (Mal.)
Owen, H. B., 468 (Oph.)
Owensby, N. M., 172 (Pel.)
Oyarzabal, J., with Dios & Zuccarini, 426 (S.S.)

P

Pacault, with Hauduroy, 354 (Und.)
Pacheco, G., 632 (Misc.), 665 (Dys.)
——, with Pinto, 279 (Z.)
Pagnier, A., with Schrumpf-Pierron, 563 (Mal.)
Paisseau, M., & Bertrand-Fontaine, 657 (Am.)
Paldrock, A., 165, 166 *ter* (Lep.)
Palestine, 832 (Mal.)
Pallary, P., 302 (Z.)
Palmer, F. J., 851 (Der.)
Pan, T. C., with Baylis & Sambon, 762 (Hel.)
Panayotatou, A., 277 (Z.), 373, 655 *bis* (Am.), 399 (Dys.), 763 (Hel.)
Panja, G., 231 (Misc.), 404 (Der.)
Pao-Yung Lui, with Young, 580 (K.A.)
Papadopoulo, J. P., 495 (Misc.)
Pappalardo, C., 276 (Z.)
Paradiso, F., 99 (K.A.)
Paras, E. M., 841 (Lep.)
Pardo-Castello, V., 939 (C.Bu.)
Park, W. H., (236) (Misc.)
Parker, R. R., & Spencer, R. R., 737 (Fev.)
——, with ——, 361 (Fev.)
Parker, S. T., with O'Leary & Goeckerman, 556 (Mal.)
Parker, W. R., 467 (Oph.)
Parman, D. C., 716 (Z.)
Parmanand, M. J., 119 (Fev.)
Parounagian, M. B., 405 (Der.)
Parra, R. J., 844 (Lep.)
de Parreiras Horta, 845 (Lep.)
Parrot, L., & Foley, H., 106 (K.A.)
——, & Lestoquard, F., 103 (K.A.)
——, with Sergent, Edm., 584 (K.A.)
——, with ——, & Donatien, 74 (Misc.)
——, with ——, & Et., Foley, & Catanei, (564) (Mal.)
Parrino, G., 458 (H.S.)
Parturier, G., with Fiessinger, 373 (Am.)
Pastore, R., 108 (K.A.)

Patane, C., 706 (Z.)
Patay, R., 118 (R.F.)
Patenostre, (78) (Misc.)
Paterson, N. F., 864 (Z.)
Patrick, A., 536 (Mal.)
Patton, W. S., 284 *bis* (Z.)
——, & MacGill, E., 285 (Z.)
Pattiradjawane, 494, 495 (Misc.)
Pavlovsky, E. N., 532 (Mal.)
Pawan, J. L., 765 (Hel.)
Pawlow, N. F., with Tschernogubow, 162 (Lep.)
Pawlowsky, E. N., 273 (Z.)
——, & Stein, A. K., 292 (Z.)
Pearce, L., & Brown, W. H., 19 (Y. & S.)
Peck, S. M., with Cornwall, 455 (Y. & S.)
——, with Goldzieher 940 *bis* (G.V.)
Pellerin, with Desage & Vinerta, 726 (Und.)
Pentman, I., 151 (Mal.)
Perdomo Hurtado, B., & Ferrer Viera, M., 933 (Y. & S.)
Perekropow, G. I., 706 (Z.)
Péretz, with MacCallan, 459 (Oph.)
Perkin, W. H., with Fairbrother, Mason & Renshaw, 59 (S.S.)
Perkins, G. A., 516 (Lep.)
Pernet, G., 564 (Mal.)
Perry, H. M., 384 (Dys.)
——, & Coppinger, C. J., 40 (Dys.)
Peruzzi, M., 43, 391 (Dys.), 488 (Misc.)
Pessôa, S. B., 780 (Hel.)
——, & Prado, A., 528 (Mal.)
Peters, L., 118 (R.F.)
Petersen, W. F., 818 (Mal.)
Petridis, P. A., (44 *bis*), (Dys.), 654, 657 (Am.)
Petrochi, J., 287 (Z.)
Pettit, A., 125, 606 (Jaun.)
Petzetakis, 32, 370 (Am.), 44 (Dys.)
Pfeiffer, E., 217 (Misc.)
Pfister, M. O., 24 (Y. & S.)
Pfister, O., 828 (Mal.)
Pfunder, M. C., 460 (Oph.)
Phelps, B. M., (236) (Misc.)
Phisalix, 694 *bis* (Rab.)
Piattelli, A., with Alessandrini, 679 (Dys.)
Pick, L., 674 (Dys.)
Pierini, L. E., with Puente, J. J., 521 (Lep.)
Pijper, A., & Russell, E. D., 827 (Mal.)
Pilcher, J. D., & Sollmann, T., 341 (Bb.)
Pineda, E. V., 512 (Lep.)
——, & Roxas-Pineda, E., 839 (Lep.)
——, & Wade, H. W., 929 (Y. & S.)
Pinto, C., & Pacheco, G., 279 (Z.)
Pinto, W., 220 (Misc.)
Pinzani, G., 695 (Rab.)
Pippia, G., 530 (Mal.)
Pittaluga, G., (152), 529 (Mal.), 576 (K.A.)
Planteureux, E., 693, 698 (Rab.)
Plaut, F., & Jahnel, F., 937 (Y. & S.)
Plehn, A., 534 (Mal.)
Plummer, F. C., 466 (Oph.)
Podzun, B., 748 (Hel.)
Pogorschelsky, H., with Neumark, 61, 916 (S.S.)
Pollitzer, R., with Vitetti, 139 (Mal.)
Pomaret, 321 (Tb.)
Pomeroy, J. K., 408 (Der.)
Pons, R., 117 (R.F.), 184 (Pl.), 252 (Hel.), 278 (Z.)
Pons, R., with Borel, Advier & Guillerm, 553 (Mal.)
——, with Guérin, 35, 663 (Am.)
——, with Lalung-Bonnaire, (193) (Ent.)
Ponsford, F. W. A., 340 (Bb.),
Pontano, T., 143 (Mal.), 652 (Am.)
Pope, W. J., & Haines, R. T. M., (236) (Misc.
Popoff, P. P., 684 (Pel.), 715 (Z.), 842 (Lep.)
Popov, P., (304) (Z.)
Popow, P. P., 715, 870 (Z.)
——, & Zeiss, H., 67 (Bl.)
Porter, A., 753 (Hel.)
Poulton, E. B., with Carpenter, 879 (Z.)
Pozzo, F., with Beretervide, 484 (Misc.)
Prado, A., with Pessoa, 528 (Mal.)
Price, E. W., 757 (Hel.)
Price, J. D., & Strickland, C., 98 (K.A.)
Prigge, R., 384 (Dys.), 593 *bis* (R.F.)
——, with Schlossberger, 930 (Y. & S.)
Priston, J. L., 345 (Sc.)
Proceedings First Volga Malaria Congress Saratov, 531 (Mal.)
Proceedings Transvaal Mine Medical Officers' Association, 309 (Tb.)
Proctor, A. H., 621 (Misc.)
Przesmycki, F., 41 (Dys.)
——, with Brokman, 383, 668 (Dys.)
Public Health Bulletin, Wash., 811 (Mal.)
Public Health Reports, 698 (Rab.)
Puca, A., 833 (Mal.)
Puente, J. J., & Pierini, L. E., 521 (Lep.)
Pulido, A., 507 (Lep.)
Pupo, A., 509 (Lep.)
Pupo, J. de A., 586 (K.A.)
Purcell, H. M., 941 (G.V.)
Purdy, J. S., 178 (Diet.)

Q

Quast, G., 693 (Rab.)
——, & Licht, H., 689 (Rab.)

R

Rabello, E., 107 (K.A.)
Rademaker, G. A., with Mertens, 670 (Dys.)
Radosavljević, A., & Ristić, L., 825 (Mal.)
Radsma, W., 635 *bis* (Misc.)
Raëvsky, A. S., (847) (Lep.)
——, & Braoul, J., 840 (Lep.)
Ragain, 817 (Mal.)
Railliet, A., 241 (Hel.)
Raimundo, J. M., 300 (Z.)
Raju, K. V., 876 (Z.)
Ramakrishnan, S., with Cunningham, 75 (Misc.)
Raman, T. K., 573 (K.A.)
——, with Mudaliar & Raman Menon, 575 (K.A.)
Raman Menon, K., with Mudaliar & Raman, 575 (K.A.)
Ramirez, J., with Schobl, 840 (Lep.)
Ramirez Corria, C. M., 283 (Z.), 371 (Am.)
Ramon, G., with Dumas & Bilal, 39, 672 (Dys.)
Ramsay, J. C., with Rudolf, 559 (Mal.)
Ramsey, T. L., 596 (R.F.)
Randoin, L., & Michaux, A., 347 (Sc.)
Rangel, M., 509 (Lep.)
Ranque & Senez, 352 (Und.)

Rao, P. R., 761 (Hel.)
Rath, H., (236) (Misc.)
Rau, P. B., 404 (Der.)
Raúl Goyena, J., 540 (Mal.), 656 (Am.)
Ravaut, P., 647 (Am.)
Rawson, P. H., 54 (S.S.)
Raynaud, L., 587 (K.A.)
——, with Marchoux, 136 (Mal.)
Raynaud, M., Lacroix, A., Béraud, M., & Boutin, P., 935 (Y. & S.)
Re, S., 439 (Myc.)
Redlich, E., 758 (Hel.)
Reed, A. C., & Wyckoff, H. A., 755 (Hel.), 798 (Sp.)
Reenstierna, J., 851 (Der.)
Reenstierna, M. J., 161, 513 (Lep.)
Regnault, J., 144 (Mal.)
Reichenow, E., 275 (Z.), 664 (Am.)
Reiter, H., 110, 601 (R.F.), 605 (Jaun.)
Reitler, R., 823 (Mal.)
Rele, V. G., & Gharpure, P. V., 322 (Tb.)
Remlinger, P., 199, 698 (Rab.), 221 (Misc.)
——, & Bailly, J., 693 (Rab.)
Renaud, H. P. J., (186) (Pl.)
Renshaw, A., with Fairbrother, Mason, & Perkin, 59 (S.S.)
Report 2nd All-Bengal Kala-Azar Conference, 574 (K.A.)
Reyher, 788 (Sc.)
Reynaud, G., (78) (Misc.)
de Rezende, M. O., 585 (K.A.)
Rhode, J., 919 (Oph.)
Rhodesian Agricultural Journal, 719 (Z.)
Riad, M., 465 (Oph.)
Ribolla, R., 301 (Z.)
Rice, E. C., with Lindsay & Selinger, 634 (Misc.)
Richardson, A., with Holmes, 739 (Fev.)
Richmond, A. R., with Young & Brendish, 735 (Fev.), 869 (Z.)
Rico, J. T., 763 *bis* (Hel.)
Riding, D., 880 (Z.)
——, with Archibald, 899 (S.S.)
Rigollet, 109 (R.F.), 219 (Misc.)
Rimpau, 400 (Dys.)
Risquez, F. A., 151 (Mal.)
Ristić, L., with Radosavljević, 825 (Mal.)
Rivas, B., with Sinton, Baily & Diwan Chand, 541 (Mal.)
de Rivas, D., 743 (Hel.)
Roberto Paso, J., 182 *bis* (Pl.)
Roberts, F. L., 266 (Hel.)
Robertson, A., with Thomson, 278 *bis*. 283, 703, 704 (Z.)
Robineau, M., 205 (Misc.), 552 (Mal.)
Robinson, L. E., 413 (B.R.)
——, with Nuttall & Warburton, 413 (B.R.)
Rochaix, A., 198, 697 (Rab.)
da Rocha Lima, H., 364 (Fev.)
Rodenhuis, Y., (186) (Pl.)
Rodenwaldt, E., (152), 563 (Mal.), 376 (Am.), 712 (Z.)
——, & Essed, W. F. R., 153 (B.R.)
Rodhain, J., 718 *bis* (Z.)
Rodrigues, S. L., 101 (K.A.)
Rodriguez, J. J., with Smith, 243 (Hel.)
Rodriguez, J. N., 161, 518 (Lep.)
Rodriguez Arjona, V., 803 (Sp.)
Roegholt, M. N., 494 (Misc.)
Roehl, W., 631 (Misc.)
Rojas, M. D., with Facio, 70 (Bl.)
Rogers, L., 510 (Lep.)
Rogers, L. M., with Goldberger, Wheeler & Lillie, 681 (Pel.)
Rollemberg Sampaio, J. M., 922 (Oph.)
Rombach, K. A., 833 (Mal.)
Rome, Proc. First Internat. Malaria Congress, 129 (Mal.)
Rosé, E., 176 (Diet.)
Rosenbaum, S., 38 (Dys.)
Ross, R., 543 (Mal.)
Rossi, P., with Senevet, (722) (Z.)
Roubaud, E., 560 (Mal.), 713 (Z.)
——, & Colas-Belcour, J., 713 (Z.)
Roukhadzé, N., 561 (Mal.), 868 (Z.)
Rouvroy, 20 (Y. & S.)
Rouvroy, H., & van Nitsen, R., 434 (Bl.)
Row, C. K., with Greval, 728 (Und.)
Row, R., 105 (K.A.), 120, 602 (Fev.), 322 (Tb.), 521 (Lep.)
Row, Y. S., 740 (Fev.), 819 (Mal.)
Rowstron, N. F., (564) (Mal.)
Roxas-Pineda, E., with Pineda, 839 (Lep.)
Roy, A., 316 (Tb.)
Royer, B. F., 921 (Oph.)
Rozier, L., 104 (K.A.)
Ruberti-Fiera, E., (620) (Pl.)
Rubinstein, B., with Epstein, 147 (Mal.)
Rudolf, G. de M., 67 (Bl.), (835) (Mal.)
——, & Ramsay, J. C., 559 (Mal.)
Ruge, R., 648 (Am.)
Russell, A. J. H., (191 *bis*) (Chl.)
Russell, E. D., with Pijper, 827 (Mal.)
Russell, M. N., 370 (Am.)
Ruys, A. C., 603 (Fev.)
Ruys, C., with Schüffner, 605 (Jaun.)

S

Sabbagh, A., with Maire, 810 (Mal.)
Sabline, D. W., 694 (Rab.)
Sabrazès, J., 515 (Lep.)
Sacasa F. J., with Fairley, Mackie, Chitre, Gokhale, Gore & Malandkar, 795 (Sp.)
Sacchetto, I., 549 (Mal.)
Saheki, Y., 252 (Hel.)
Salcedo, Jr., J., with Concepcion, 841 (Lep.)
Salimbeni, A. T., Kermorgant, Y., & Garcin, R., 121 *bis*, 123 (Fev.)
Salmon, W. D., 341 (Bb.)
Salvo, C., with Fossati, 563 (Mal.)
Salvo ; Gérard ; Cortesi, 587 (K.A.)
Sambon, J. E. B., with Baylis & Pan, 762 (Hel.)
Sambon, L. W., 253 (Hel.)
Samsonoff, P. F., 146 (Mal.)
Sanarelli, G., 135 (Mal.)
Sandground, J. H., 758, 759 (Hel.)
Sangiorgi, G., 121 (Fev.)
Santos, J. K., 481 (Misc.
Sarafoff, D., with Seyfarth & Kussitasseff, 111 (R.F.)
Sarchi, G., 536 (Mal.)
Sarcinella, F., 760 (Hel.)
Sasaki, N., with Muto, 258 (Hel.)
Sato, K., with Nagayo, Tamiya, Imamura, Miyagawa & Mitamura, 362 (Fev.)
Savtchenko, J. G., & Baronoff, J. M., 826 (Mal.)

Sawyer, W. A., 266 (Hel.)
Scanlon, R. W., 404 (Der.)
Schabaschov, D., 564 (Mal.)
Schaefer, H., 70 (Bb.)
Schaeffer, W. F. F., 406 (Der.)
Schapira, L., 736 (Fev.)
Schauder, H., with Steiner, 114 (R.F.)
Schern, K., 428 (S.S.), 698 (Rab.)
Schijveschuurder, W., 29 (Y. & S.), 116 (R.F.)
Schilling, C., 700 (Z.)
Schilling, V., 107 (K.A.)
Schirwind, S. L., with Yakimoff & Ioukowsky, (236) (Misc.)
Schlegel, M., 698 (Rab.)
Schlingman, A. S., 697 (Rab.), 744 (Hel.)
Schlossberger, H., & Hartoch, O., 390 (Dys.)
——, & Prigge, R., 930 (Y. & S.)
Schmidt, H., 674 (Dys.)
——, with Kuhn, 628 (Misc.)
——, with Uhlenhuth & Kuhn, 482 (Misc.)
Schmitt, K., 346 (Sc.)
v. Schnizer, 834 (Mal.)
Schnürer, J., 200 (Rab.)
Schobl, O., & Ramirez, J., 840 (Lep.)
Schoening, H. W., 197 (Rab.)
Schofield, A. T., 54, 904 (S.S.)
Schott, A., with Feldt, 112 (R.F.)
von Schroetter, H., (458) (H.S.)
Schroll, G., 803 (Sp.)
Schrumpf-Pierron, P., & Pagnier, A., 563 (Mal.)
Schuberg, A., & Böing, W., 917 (S.S.)
Schüffner, W., 117 (R.F.), 528 (Mal.)
——, & Ruys, C., 605 (Jaun.)
Schükri, A., 492 (Misc.)
Schükry, J., 492 (Misc.)
Schulze, 149 (Mal.)
Schulz, R. E., 254 (Hel.)
Schut, W., 150 (Mal.)
Schütze, H., 185 (Pl.)
Schwartz, A. B., 922 (Oph.)
Schwartzmann, A. M., 834 (Mal.)
Schweinburg, F., 195 (Rab.)
Schweisguth, with Collin, 460 (Oph.)
Sciencia Medica, 624 (Misc.)
Sdrodowski, P., & Brenn, E., (191) (Chl.)
Seabra, P., 845 (Lep.)
Searle, A. C. H., 524 (Lep.)
Sechi, E., 514 (Lep.)
Sédan, J., 461, 464 (Oph.)
Seguin, T., 543 (Mal.)
Séguy, E., 292 (Z.)
——, with Lancelin & Dubreuil, 732 (Und.)
Sei, S., & Weise, W., 26 (Y. & S.)
Seidelin, H., 478, 493 (Misc.), 544 (Mal.)
Selinger, M. A., with Lindsay & Rice, 634 (Misc.)
Semenov, G. M., 760 (Hel.)
Sen, P. B., with Brahmachari, 225 (Misc.), 432 (Bl.)
Senevet, G., (304), 868 (Z.)
——, with Landrieu, 530 (Mal.)
——, & Rossi, P., (722) (Z.)
Senez with Ranque, 352 (Und.)
Senga, H., & Yasutomi, Y., 784 (Bb.)
Sengupta, N. R., 315 (Tb.)
Senior-White, R., 707 (Z.)
Sergent, Mignot, R., & Kourilsky, R., 727 (Und.)
Sergent, Et., 713 (Z.)
Sergent, Et., & Catanei, A., 548 (Mal.)
——, ——, Gueidon, E., Bouguet, A., & Des Isles, H. M., 583 (K.A.)
——, with Sergent, Edm., 830 (Mal.)
——, ——, & Catanei, A., 701 *bis* (Z.)
Sergent, Edm., 885 (Lab.)
——, & Parrot, L., 584 (K.A.)
——, ——, & Donatien, A., 74 (Misc.)
——, & Sergent, Et., 830 (Mal.)
——, ——, Parrot, L., Foley, H., & Catanei, A., (564) (Mal.)
Seydel, C., 297, 721, 872 (Z.)
Seyfarth, C., (186) (Pl.) 208 (Misc.)
——, Sarafoff, D., & Kussitasseff, K., 111 (R.F.)
Shakhov, S. D., 869 (Z.)
Shannon, R. C., & Greene, C. T., 872 (Z.)
Sharp, C. G. K., 329 (B.R.)
Sharp, N. A. D., 589 (R.F.), 761 (Hel.)
Sheldon, H. F., 156 (Lep.)
Shelley, H. M., 685 (Pel.), 781 (Hel.)
Shelton, C. F., 802 (Sp.)
Shepard, C. A., with Callender & Kirkwood, 319 (Tb.)
Shepardson, H. C., with Hosford, 923 (Oph.)
Shingarev, N. I., 712 (Z.)
Shiozawa, S., with Koshina & Kitayama, 598 (R.F.)
Shircore, J. O., 931 (Y. & S.)
——, Corson, J. F., & Clearkin, P. A., 544 (Mal.)
Shipley, P. G., with Chavarría, 409 (Der.)
Shortt, H. E., Barraud, P. J., & Craighead, A. C., 573 (K.A.), 714 (Z.)
——, ——, & Swaminath, C. S., (722), (Z.)
——, with Christophers & Barraud, 94, 95, 97, 103 *bis* (K.A.)
——, & Swaminath, C. S., 96, 97 (K.A.)
Shrivastava, N. P., 252 (Hel.)
Shute, P. G., with James, 804 (Mal.)
Silberstein, F., with Hoff, 595 (R.F.)
Siler, J. F., Hall, M. W., & Hitchens, A. P., 360, 734 (Fev.)
De Silva, W. K., with Vallipuram, (615) (Chl.)
Silverston, J. D., 115 (R.F.)
——, with Grant, 826 (Mal.)
Silvestro, L., 852 (Der.)
Sinderson, H. C., 586 (K.A.)
Singh, S. A. S. C., 298 *bis* (Z.)
Sinton, J. A., 142, 541 *ter* (Mal.), 715, 869 (Z.)
——, assisted by Baily, J. D., & Chand, D., 813 (Mal.)
——, assisted by Eate, S. N., 822 (Mal.)
——, assisted by Rivas, B., Baily, J. D., & Diwan Chand, 541 (Mal.)
Sitsen, A. E., 216 (Misc.)
Skriabin, K. I., 743 (Hel.)
Slaughter, W. H., 816 (Mal.)
Slot, J. A., 140 (Mal.)
Smillie, W. G., & Augustine, D. L., 263, 772 *bis* (Hel.)
——, with ——, 773 (Hel.)
Smith, E. C., with Connal, 382 (Dys.)
Smith, H., 464 (Oph.)
Smith, H. W., 37 (Dys.)
Smith, N. M., with Barret, 664 (Am.)
Smith, R. O. A., 870 (Z.)
——, with Lloyd & Napier, 95 (K.A.)
Smith, R., & Rodriguez, J. J., 243 (Hel.)

Smith, T., 724 (Und.)
Smits, E., 143 (Mal.), 480 (Misc.)
Smyly, H. J., 99 (K.A.)
— , with Young & Brown, 581 (K.A.)
Snijders, E. P., 223 (Misc.)
Snowman, J., 329 (B.R.)
Sobernheim, 23 (Y. & S.)
Société des Nations, 576 (K.A.)
Society for the Preservation of the Fauna of the Empire, 289 (Z.)
Soetomo, R., & Eichhorn, 18 (Y. & S.)
Sohi, U. R., 904 (S.S.)
Sokolowa, with Gloukhoff & Goremykina, 189 (Chl.)
Solis, F., & Wade, H. W., 513 (Lep.)
Sollmann, T., with Pilcher, 341 (Bb.)
van Someren, V. G. L., & de Boer, H. S., 706 (Z.)
Soper, F. L., 768 (Hel.)
Sorokin, G. E., 604 (Fev.)
Spaar, E. C., 208 (Misc.)
Spagnolio, G., (152) (Mal.)
Spencer, J. H., 549 (Mal.)
Spencer, R. R., & Parker, R. R., 361 (Fev.)
——, with ——, 737 (Fev.)
Spittel, R. L., (78) (Misc.)
Stanković, S., (722) (Z.)
Stannus, H. S., 1, 81 (Y. & S.)
Stanton, A. T., 888 (Lab.)
Steel, J. P., with Nicole, 557, 558, (835) (Mal.)
van Steenis, P. B., 186 (Pl.), 803 (Sp.)
Steichen, A., with Caius, 299 (Z.)
Stein, A. K., with Pawlowsky, 292 (Z.)
Steiner, G., & Schauder, H., 114 (R.F.)
——, & Steinfeld, J., 114, 594 (R.F.)
Steinhauer, H., with Bach, 649 (Am.)
Steinfeld, J., with Steiner, 114, 594 (R.F.)
Stekhoven, Jr., J. H. S., 716 (Z.)
Stephens, J. W. W., 64 (Bl.)
Stern, E., 66 *bis* (Bl.), 295 (Z.)
Sternberg, H., 721 (Z.)
Steudel, E., 222, 625 (Misc.), (918) (S.S.)
Stevenson, W. D. H., 697 (Rab.)
——, King, H. H., Nicholas, M. J., & Lahiri, B. N., 697 (Rab.)
Stieffel, R., with Emile-Weil, 435, 436 (Bl.)
Stier, with Decrop, 255 (Hel.)
Stiles, C. W., & Hassall, A., 535 (Mal.)
Stillmunkès, A., with Bardier, 879 (Z.)
St. John, J. H., 657 (Am.)
Stoll, N. R., with Cort & Grant, 264 (Hel.)
——, & Hausheer, W. C., 776 *bis* (Hel.)
Stones, R. Y., 591 (R.F.)
Strada, L., & Lopes, A. J., 423 (S.S.)
Straub, M., 479 (Misc.)
Strickland, C., 287 (Z.)
— , with Price, 98 (K.A.)
Strong, R. P., (236) (Misc.)
Stuart, G., & Krikorian, K. S., 695 (Rab.)
Stucky, J. A., 462 (Oph.)
Stühmer, A., 245 (Hel.)
Suchanka, F., 744 (Hel.)
Suda, H., with Kimura & Kishida, 297 (Z.)
Sukneff, V. V., 180 (Pl.)
Suldey, E. W., 823 (Mal.)
Surti, S. B., 938 (Y. & S.)
Susman, W., 687 (Pel.)
Sutton, E. A., 871 (Z.)
Suyemori, S., 258 (Hel.)
Suzuki, S., with Dohi & Takahashi, 850 (Der.)
Suzuki, S., with Ogata, Kauakita & Kagosima, (786 *bis*) (Bb.)
Svensson, R., 268 (Hel.)
Swalm, W. A., with Lyon, 275 (Z.)
Swaminath, C. S., with Shortt, 96, 97 (K.A.)
— —, — & Barraud, (722) (Z.)
Sweet, W. C., 268, 767, 779 (Hel.)
Swellengrebel, N. H., 150, 529, 560 (Mal.) 287 (Z.)
Swezy, O., with Boyers & Kofoid, 365 (Am.)
— , with Kofoid, (304) (Z.)
Swynnerton, C. F. M., 50 (S.S.)
Sylvain, N. G., (236) (Misc.)
Symes, C. B., 289, 865 (Z.)
Szemö, G., 275 (Z.)

T

Tai, J. T., 752 (Hel.)
Takahashi, S., with Dohi & Suzuki, 850 (Der.)
Takaki, I., (123) (Fev.)
Takano, R., 784 (Bb.)
Takeshita, S., & Okuda, M., 255 (Hel.)
Taliaferro, L. G., 280 (Z.)
Taliaferro, W. H., & Fisher, A. B., 664 (Am.)
Tamiya, T., with Nagayo, Imamura, Sato, Miyagawa & Mitamura, 362 (Fev.)
Tamura, I., with Kasuga, 587 (K.A.)
Tanabe, M., 705, 706 (Z.)
——, with Taoka, 122 (Fev.)
Tanaka, G., 754 (Hel.)
Tanaka, I., 387 (Dys.)
Tanganyika Territory, 885 (Lab.)
Tanner, W. F., with Goldberger & Wheeler, 172 (Pel.)
Tanon, L., 353 (Und.)
— , & Jamot, E., 52 (S.S.)
Taoka, K., & Tanabe, M., 122 (Fev.)
Tarchini, P. P., 159 (Lep.)
Taylor, F. E., with Castellani, 438 (Myc.)
Taylor, J., with Gloster, assisted by Menon, K. N., 696 (Rab.)
Telang, D. M., with Dundas, 551 (Mal.)
Teodosijevits, 43 (Dys.)
Terdschanian, A., 401 (Der.)
Terra, F., 475 (Misc.)
Terzani, A., (400) (Dys.)
Tewfik, M., 465, 467 (Oph.)
Thatcher, H. S., with Gammel & Miskdjian, 408 (Der.)
Thaysen, T. E. H., 46 (Sp.)
Theiler, M., 602 (Fev.)
Theodor, O., with Adler, 105 (K.A.), 283, 714, (721) (Z.)
van Thiel, P. H., 476 (Misc.), 712 (Z.), 777 (Hel.)
Thierfelder, M. U., 454 (Y. & S.)
——, & Thierfelder-Thillot, M., 941 (G.V.)
Thirupad, R. K., 562 (Mal.)
Thomas, W. S., & Baumgartner, E. A., 274 (Z.)
——, with ——, 800 (Sp.)
Thompson, E. T., with Castellani & Douglas, 440 (Myc.)
Thomson, J. G., 68 (Bl.), 859 (Z.)
——, & Lucas, C. L. T., 664 (Am.)
——, & Robertson, A., 278 *bis*, 283, 703, 704 (Z.)
Thorp, E., 122 (Fev.)
Thrash, E. C., (564) (Mal.)

Thurston, E. O., 653 (Am.)
Tijssen, J., with Nikolai, 73 (Misc.)
Timpano, P., 587 (K.A.)
Tinti, M., 356, 728 (Und.)
Toldt, Jr., K., 874 (Z.)
Tomaselli, A., with Valenti, 143, 821 (Mal.)
Tomb, J. W., 734 (Fev.)
Tommaso, L., 536 (Mal.)
Torres, C. M., with Villela, 63 (S.S.)
Toshyu, K., 823 (Mal.)
Tournier, E., 596 (R.F.)
Trabaud, 31 (Am.), 537, 816 (Mal.)
Trabaud, J. P. R., 339 *bis*, 783 (Bb.), 642 (Am.), 734 (Fev.)
Transactions Royal Society of Tropical Medicine & Hygiene, 891 *bis*, 892 (Lab.)
Travers, E. A. O., 520 (Lep.)
Trentini, S., 729 (Und.)
Trocello, E., & Cruto, A., 76 (Misc.)
Trömner, E., & Baltzer, H., 149 (Mal.)
Trout, C. L., 70 (Bl.)
Truffi, M., 108 (K.A.)
Tsang, M. L., 25 (Y. & S.)
Tscherikower, R. S., with Kritschewsky, 599 (R.F.)
Tschernogubow, N. A., & Pawlow, N. F., 162 (Lep.)
Tsuchiya, H., 274 (Z.)
Tsuchiya, K., with Kawamura, (400) (Dys.)
Tsunashima, Y., 781 (Hel.)
Tsunetsugu, H., 191, 614 (Chl.)
Tsurumi, M., 185 (Pl.), 495 (Misc.)
Tung, C. L., 784 (Bb.)
Turevich, E. I., 200 (Rab.)
Turkhud, D. A., Krishnan, K. V., & Iyer, P. V. S., 574 (K.A.)
Tzanck, A., with Gilbert & Cabanis, 515 (Lep.)

U

Uchida, S., 510 (Lep.)
Uhlenhuth & Grossmann, 599 (R.F.)
——, Kuhn, P., & Schmidt, H., 482 (Misc.)
Unger, R., 151 (Mal.)
United Fruit Company, 203 (Misc.)
United States Naval Medical Bulletin, 302 (Z.) 457 (H.S.)
Urbino, G., 162 (Lep.)
Urchs, O., 241 (Hel.)
Uribe, C., 914 (S.S.)
——, with de Bellard, 490 (Misc.)
Urrets Zavalia, A., 461 (Oph.)

V

Vaccarezza, R. F., 769 (Hel.)
——, with Destéfano, 227 (Misc.)
Valenti, F., & Tomaselli, A., 143, 821 (Mal.)
Valerio, A., 540 (Mal.)
Vallipuram, K., & De Silva, W. R., (615) (Chl.)
van den Branden, F., 163, 515 (Lep.), 376 (Am.), 423, 424, 426, 900, 909 (S.S.), 448 (Y. & S.), 550 (Mal.)
van den Hoven van Genderen, J., 690 *bis*, 696 (Rab.)
van der Hoeven, B. J. C., with Levene, 342 (Bb.)
van der Scheer, J., with Landsteiner, 916 (S.S.)
van der Spuy, A. J., 650 (Am.)
Vassal, J., (236) (Misc.)
Vassallo, S. M., with Marshall, 908 (S.S.)
Vaz, E., 388 (Dys.)
Vazquez-Colet, A., 378 (Dys.)
Vellard, J., with Brazil, 301 *bis* (Z.)
Velu, 698 (Rab.)
——, Bigot, A., & Eyraud, R., 698 (Rab.)
Veneroni, C., 715 (Z.)
de Vera, B., 518 (Lep.)
Vercellana, G., 357 (Und.)
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Tokyoer Medizinische Wochenschrift (Tokyo) ...	1917—	No.	2046—	
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Archives de l'Institut Pasteur de Tunis (Tunis) ...	1906—	Vol.	1—	
Archivo Italiano di Science Mediche Coloniali (Tripoli)	1920—	Vol.	1—	
Bulletin Médical du Katanga (Elisabethville) ...	1924—	No.	1—	
Bulletin de la Société Ophthalmologie d'Egypte ...	1912—			
Farming in South Africa (Pretoria)	1926—	Vol.	1—	
[Journal of the Department of Agriculture, Union of South Africa (Pretoria)	1921–26	Vols.	1–12]	
Journal of the Medical Association of South Africa (British Medical Association) (Cape Town) ...	1927—	Vol.	1—	
Kenya Medical Journal (Nairobi)	1924—	Vol.	1—	
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[Medical Journal of South Africa [formerly Transvaal Medical Journal] (Johannesburg)	1912–26	Vols.	8–22]	
[*Nyasaland Sleeping Sickness Diary (Zomba)* ...	1908–15	Nos.	1–25]	

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Proceedings of the Transvaal Mine Medical Officers' Association (Johannesburg)	1921—	Vol.	1—	
Revista Médica de Angola (Loanda)	1921—	Vol.	1—	
Rhodesia Agricultural Journal (Salisbury)	1915—	Vol.	12—	
South African Institute for Medical Research—Publications	1913–26	Vols.	1–24	
[South African Medical Record (Cape Town) ...	1910—	Vol.	8—]	

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Australian Institute of Tropical Medicine Collected Papers (Townsville)	1914—	No.	1—	
Commonwealth of Australia: Quarantine Service Publications (Melbourne)	1920–23	No.	1–19	
Commonwealth of Australia: Department of Health. Service Publications (Melbourne)	1922—	No.	20—	
Industrial Hygiene	1924—	No.	1—	
Tropical Division	1923—	No.	1—	
Veterinary Hygiene	1924—	No.	1—	
Health (Melbourne)	1923—	Vol.	1—	
[*Health Forum (Sydney)*	1923—	Vol.	1—	Nos. 1–4]
Journal of the Australian Veterinary Association (Sydney)	1925—	Vol.	1—	
Medical Journal of Australia (Sydney)	1914—	Vol.	1—	
Queensland Agricultural Journal	1919—	Vol.	12—	
Records of the South Australian Museum	1918—	Vol.	1—	

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New Zealand Medical Journal (Wellington) ...	1913—	Vol.	12—	No. 45—

The Bureau possesses complete sets of the following JOURNALS WHICH HAVE CEASED PUBLICATION :—

American Journal of Tropical Diseases and Preventive Medicine (New Orleans)	1913–16	Vols.	1–3
American Society of Tropical Medicine—Transactions (New Orleans)	1904–14	Vols.	1–9
Archives des Instituts Pasteur de l'Afrique du Nord (Algiers & Tunis)	1921–22	Vols.	1–2
Bulletin Sanitaire de Constantinople [formerly *Bulletin de l'Administration Sanitaire des frontières*] *(Constantinople)*	1921–23	Nos.	1–20
Bulletin de la Société Medico-Chirurgicale française de l'Ouest-Africain (Dakar)	1919–21	Vols.	1–3
Ectoparasites (London)	1921	Vol.	1
Folia Microbiologica (Delft)	1912–19	Vols.	1–4
International Journal of Public Health (Geneva) ...	1920–21	Vols.	1–2
Journal of the London School of Tropical Medicine (London)	1911–13	Vols.	1–2
Journal of Tropical Veterinary Science (Calcutta)...	1906–12	Vols.	1–7
Kala Azar Bulletin (London)...	1911–12	Nos.	1–3
Medical Science. Abstracts and Reviews (London)...	1919–25	Vols.	1–12
Paludism (Simla)	1910–12	Nos.	1–5
Proceedings of the Medical Association of the Isthmian Canal Zone [formerly *Proceedings of the Canal Zone Medical Association*] *(Mount Hope, C.Z.)*...	1908–23	Vols.	1–13
Reports of the Sleeping Sickness Commission of the Royal Society (London)	1903—	No.	1—
Scientific Memoirs by Officers of the Medical & Sanitary Department of the Government of India (Calcutta)	1902–12	(New Ser.) Nos.	1–60
Sleeping Sickness Bulletin (London)	1908–12	Vols.	1–4
Yellow Fever Bureau Bulletin (Liverpool)	1911–15	Vols.	1–3

NOTE.—The Director would consider proposals for the exchange of the Bureau publications with other medical and scientific journals in which original papers on hygiene, tropical diseases or parasitology are published.

The following serial publications not received by the Bureau are taken by the London School of Hygiene and Tropical Medicine and are available for reference in the joint library of the School and the Bureau (TROPICAL DISEASES LIBRARY) :—

Annales de Médecine (Paris)	1920—	Vol. 7—	
Archiv für Prolistenkunde (Jena)	1925—	Vol. 53—	
Australian Journal of Experimental Biology and Medical Science (*Adelaide*)	1924—	Vol. 1—	
Biochemical Journal (London)	1923—	Vol. 17—	
Boletin de la Oficina Sanitaria Panamericana (*Washington*)	1922—	Vol. 1—	
British Journal of Dental Science (London) ...	1922—	Vol. 65—	
British Journal of Venereal Diseases (*London*) ...	1925—	Vol. 1—	
Bulletin de l'Académie de Médecine (Paris) ...	1922—	Vol. 87—	
Bulletin du Comité d'Etudes Historiques et Scientifiques de l'Afrique Occidentale Française (Gorée)	1924—	Vol. 7—	
Bulletin of the New York Academy of Medicine (New York)	1925—	2nd Ser.	Vol 1—
Clifton Medical Bulletin (Clifton Springs, N.Y.) ...	1922—	Vol. 8—	
Comptes Rendus de l'Académie des Sciences (Paris)	1910—	Vol. 150—	
Днепропетровский (ь. Екатеринославский) Медицинский Журнал (Dniepropetrovsk) ...	1926—	Vol. 5—	
Index Medicus (Washington)	1921—	3rd Ser.	Vol. 1—
Indian Medical Record (Calcutta)	1919—	Vol. 39—	
Journal de physiologie et de pathologie générale (Paris)	1919—	Vol. 18—	
Magyar Orvosi Archivum (Budapest)	1925—	Vol. 26—	
Medical Annual (Bristol)	1921—	Vol. 39—	
Mitteilungen aus dem Zoologischen Museum in Berlin	1910—	Vol. 5—	
Orvosi Hetilap (Budapest)	1923—	Vol. 67—	
Quarterly Cumulative Index to Current Medical Literature (*Chicago*)	1916—	Vol. 1—	
Records of the Indian Museum (Calcutta)	1916—	Vol. 12—	
Sanidad y Beneficencia (Habana)	1910—	Vol. 3—	
Transactions of the South Indian Branch of the British Medical Association (Madras)	1899—	Vol. 8—	
Tropical Agriculture (*Trinidad*)	1924—	Vol. 1—	
Zoological Record (London)	1920—	Vol. 57—	